The OIL WEEKLY

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LOOKING AHEAD
. . . with the Editor

SYNTHETIC rubber because of its superior qualities is proving to be a more desirable product for many oil field applications than the natural product. Already the cost of some field operations has been lowered through the use of tools with synthetic rubber parts.

In tubing packers, well-head sealers and other maintenance tools for example, oil-resistant synthetic rubber has now become a vital material.

This special purpose rubber known as butadiene—acrylo—nitrile synthetic rubber has unusual properties of resistance to oil, gas, acid, heat and abrasion, plus a high tensile strength and good elongation.

The contribution of the petroleum industry to the synthetic rubber program is widely known. It is not generally realized however, that the petroleum industry is benefitting from synthetic rubber to the extensive degree that it is.

Oil drillers first discovered the high quality of synthetic rubber when it was used for blowout-preventer ram packing. In quick order, the petroleum industry extended the use of the man-made petroleum base product to various other devices.

Frank M. Andrews, general sales manager of Hycar Chemical Company, Akron, Ohio, discusses synthetic rubber's contribution to oil field operations in an article to appear in an early issue.

THE OIL WEEKLY

ENGINEERING • NEWS • STATISTICS

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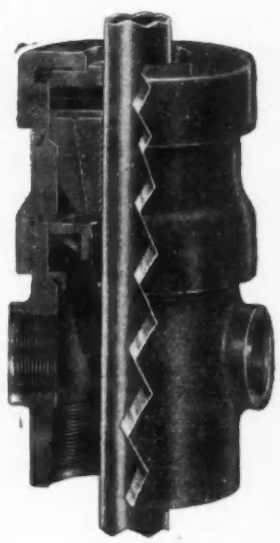

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The Changing Panorama

Overcoming the Housing Shortage

ONE continues to hear considerable complaint about the shortage of houses hampering oil field operations. Many drilling contractors, service companies and even oil operators apparently fail to realize that they can help themselves solve the housing problem.

It is possible to buy second-hand trailer houses. And if the situation is as acute as some indicate, it might be wise to make such purchases, even though there are no ceiling prices on such houses, and the prices are high.

Furthermore, it is possible to use PAW production priority ratings (AA-2X; P1) for getting new trailers built and for buying prefabricated houses. Either the employers or employes are permitted to do this.

Several concerns have used one or several of these means to improve employe housing conditions. Some firms have established trailer camps in nearby towns. One large oil company recently answered its needs for housing geophysical crews by such procedure.

Electronics Invade Vulcanizing Field

ELECTRONIC vulcanization of rubber has passed from the novelty to the useful stage, and there are now enough practical commercial applications of electronic heating to justify the use of this process in many more operations. Basic patents covering electronic vulcanization of rubber and other materials have been purchased by The B. F. Goodrich Company and the Firestone Tire & Rubber Company.

The rubber companies have stated that the patents would be made available to both the rubber and plastics industries on a reasonable basis believing that this policy will speed electronic development ultimately making available to consumers improved rubber and plastic products at lower costs.

In electronic vulcanization, high frequency oscillations shake the molecules of rubber and sulphur millions of times a second, creating uniform heat throughout the product being vulcanized in a fraction of the time required when steam is used.

The cost last year to find, develop and produce a barrel of oil was $1.47, according to the API. William R. Boyd, Jr., Institute president said recently that "since 1859 more money has been spent on the drilling of dry holes than has been recovered by the sale of crude oil.

March Production Quota Real Problem

THE industry is expected to produce the largest quantity of crude oil in its history during March. PAW's crude oil production certifications for that month call for 4,793,350 barrels per day, exclusive of natural gasoline and condensate output. This is 36,550 barrels more daily than in February, the previous record month.

Will the industry be able to produce this huge quantity? Recent actual production rates are not encouraging, for in late months they have been falling behind volumes requested by PAW by steadily increasing amounts. If the industry succeeds in fulfilling its March production quota, operators must do better than they have recently, which means a greater effort to keep their wells producing at maximum rates.

November actual United States production of crude oil, according to the Bureau of Mines, was 4,747,000 barrels daily, or 27,000 barrels more than the amount requested by PAW for that month. This is the latest period for which final production figures are available. However, a good guide to more recent performance can be obtained by comparing production as reported by the American Petroleum Institute with PAW's allocations. Such a study indicates production failed to equal PAW's certification during December by 5000 barrels daily, and that the shortage increased to about 18,000 barrels daily in January when PAW boosted its allocation but production remained virtually unchanged from December.

It is not known whether the failure to produce as much as PAW has requested has been due to cold weather hampering field operations, to inability to produce such large amounts, or, as some believe, to a reluctance on the part of producers to increase their output. However, only the possibility of better weather improves the chances that production in March will be closer to PAW's quota.

Texas Is Key in Meeting Oil Needs

THE growing margin by which the nation's actual production of crude oil has failed in recent months to equal PAW certification rates is made more important because it is due to the sudden failure of its largest producing state to meet its quota. For sometime various states have not been producing as much as PAW asked, but the recent increase of underage, as outlined in the preceding item, is due to Texas' failure to produce its allocations, this in contrast with its former excellent record.

For the first time, Texas' actual production of crude oil failed by a substantial amount—22,500 barrels daily—to equal the volume certified by PAW in December. This represented a sharp change in Texas' performance, its November production having been right "on the button." The state's shortage gains additional significance because the amount requested by PAW was the same for both months, and therefore the increase is due entirely to the production of less crude oil.

All of Texas' December shortage was in sweet crude fields. Sour crude fields produced 470,000 barrels daily in December, 8000 barrels more than certified. However, sweet crude production was 1,640,000 barrels or 31,000 barrels under.

Preliminary figures indicate Texas did somewhat better in January with production about 15,000 barrels more crude daily than in December. No doubt this was due to the additional producing day contributed by the East Texas field. But because PAW boosted its certification to 2,140,000 barrels daily, the state's production was still 15,000 barrels under that level.

As to be expected, Texas is scheduled to furnish most of the additional crude oil the nation is due to produce in March. PAW has asked Texas operators for 20,000 barrels of the additional 36,550 barrels wanted. In view of the state's recent failure to produce as much as PAW has requested, although the Texas Railroad Commission has been setting allowable rates at the PAW level, can the state do any better in March?

Because all of the 20,000 barrel increase has been assigned to West Texas, an area capable of meeting its larger quota, the deficient should be no larger.

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1. *Quiet-operating spiral-bevel gear train*—Both gear and pinion are fully heat-treated for maximum toughness and wear-resistance. The pinion teeth, in addition, are surface-hardened.
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Maximum Recommended Drilling Depth....(feet)	17,000	7,500	17,000
Maximum Recommended Table Speed....(r.p.m.)	1,000	400	400
Gear Ratio.....	2.61:1	3.93:1	3.84:1

For information on other "Oilwell" rotaries or major items of drilling and production equipment, please refer to pages 2233 to 2268 in The Composite Catalog of Oil Field Equipment. Or, inquire at the nearest "Oilwell" store or office.

"OILWELL"

However, there is nothing to indicate that other districts of the state will produce more than they have been doing.

Future Ceiling on Raw Rubber Provided

AMERICAN scientists, engineers and production men have achieved in five years with synthetic rubber what it took nearly 70 years to accomplish with natural rubber, James J. Newman, vice president of the B. F. Goodrich Company recently ponted out.

The ability to use American man-made rubber for all essential war products—and in such volume that it now constitutes 85 percent of the overall volume of rubber this country is using—"has been a life-saver," Newman said, "for today we are nearer the bottom of the natural-rubber barrel than we have ever been, with military requirement continuing to mount as our active war front widens and supply lines lengthen."

It is impossible now to foresee the ultimate "balance of power" between natural and synthetic rubber, in view of the changing costs and techniques, Newman said. But, he added, "the most reassuring fact, and one that we can depend on, is that America's performance in creating and using synthetic rubber has provided an effective ceiling over future raw rubber costs—which is important to the goals we all are seeking, of more and better products, wider markets, and more jobs."

State Tax Plans Would Touch Oil

BILLS introduced in the present Texas Legislature propose to assess in new taxes, the sum of $109,749,000. The petroleum industry is called upon to pay of this total, $78,173,000. In addition, it is proposed to increase gasoline taxes $16,443,128.

Eight states beside Texas have also proposed increases in gasoline taxes. Two states have brought up bills to tax diesel fuel and another has asked that a present emergency gasoline tax be made permanent. Gasoline tax increases have been asked for in these states: California, Colorado, Nebraska, Connecticut, North Dakota, Pennsylvania, Massachusetts, Oklahoma and Texas.

☆

A B-29 bomber's fuel tanks hold the same quantity of fuel as a railroad tank car.

—The Texaco Star.

Some Are Helped by WPB Steel Request

CONCERN had been expressed in some quarters that PAW requests that certain operators cancel orders for a percentage of their first-quarter tubular goods might have the effect of causing sharp reverses in field activity, but inquiry develops that there is little likelihood that the overall drilling program will be appreciably affected.

The situation is another outgrowth of the transportation shortage caused by adverse weather conditions in certain parts of the United States, and to a lesser degree an effect of the critical military situation in Europe around the first of the year. With an accelerated drilling program set up by companies at the urgent request of PAW, many wells were scheduled with the understanding that tubular goods would be available. Delivery of substantial amounts has been impossible through the bad-weather period during which it was necessary to impose an embargo on all non-military shipments through certain areas. As a consequence the PAW has attempted to effect a redistribution of inventories on hand so that those with plenty could help out those who were pinched. It is not thought that this will result in a decrease in overall drilling to any considerable extent, but that it will mean only that completions might be a different group than those previously programmed. The quota of steel for actual use during the quarter remains unchanged and will probably all be used, but some of it will be used by operators borrowing from surplus stocks of others.

The redistribution is purely voluntary. It was accomplished through request and not through directives, and governmental agencies involved have been gratified by the cooperation shown by all operators contacted.

Proper Placement For Young Chemists

TERMING the present interpretation of the selective service law, as regards technically trained personnel, "senseless," the American Chemical Society, in a reprint from *Industrial and Engineering Chemistry*, January, 1945, pleads for attention to this matter:

"Our allies and our enemies alike are preparing the greatest number of chemists in their history, but we—we are sending our future chemists into the armed forces to perform every sort of task except making America technologically strong in peace or in war."

The loss of an entire generation of scientists is likely "unless we do something constructive in the matter of returning the mental cream of the Nation's youth as bona-fide students to its classrooms," the editorial says.

It is pointed out that today we have about 15,000 trained chemists and chemical engineers in the armed forces. Less than a "corporal's guard" of this number are serving as chemists or chemical engineers. Their services as such are not needed in the Army.

"They are sorely needed in America's production army—the army that is producing explosives to make our guns vocal, the army that provides aviation gasoline for our boys to fly the planes, the army that makes suifa drugs, penicillin, blood plasma, and DDT so that our boys may live instead of dying on the frozen fields of Germany or in the oozing mud of Leyte. Yes, it is also the army that can make worth-while jobs for our boys to come back to instead of raking leaves and selling apples," the editorial urges.

Tank Trucks' Role In Business of War

HIGHWAY transportation, which three years ago was moving 25,000,000 gallons of petroleum products over the road every day, is currently delivering 128,000,000 gallons daily. The story behind this five-fold increase in volume reveals one of the greatest business performances of the domestic war front, according to the National Highway Users Conference.

In this operation the nation's 14,000 over-the-road tank vehicles took over the short-haul business formerly handled by 73,000 railway tank cars. Formerly it took a railway tank car with a 10,000-gallon capacity five days to load, travel to destination, unload, switch around and get back to point of origin again on a 25-mile haul. On the other hand, a motor vehicle with a 4000-gallon capacity can make six round trips daily over the same distance and deliver 120,000 gallons of petroleum products, or 12 times as much as the tank car, in five days.

This vast accomplishment, without which, the shortage of civilian gasoline and fuel oil would have been even more acute, was achieved through cooperation of government agencies and motor vehicle operators.

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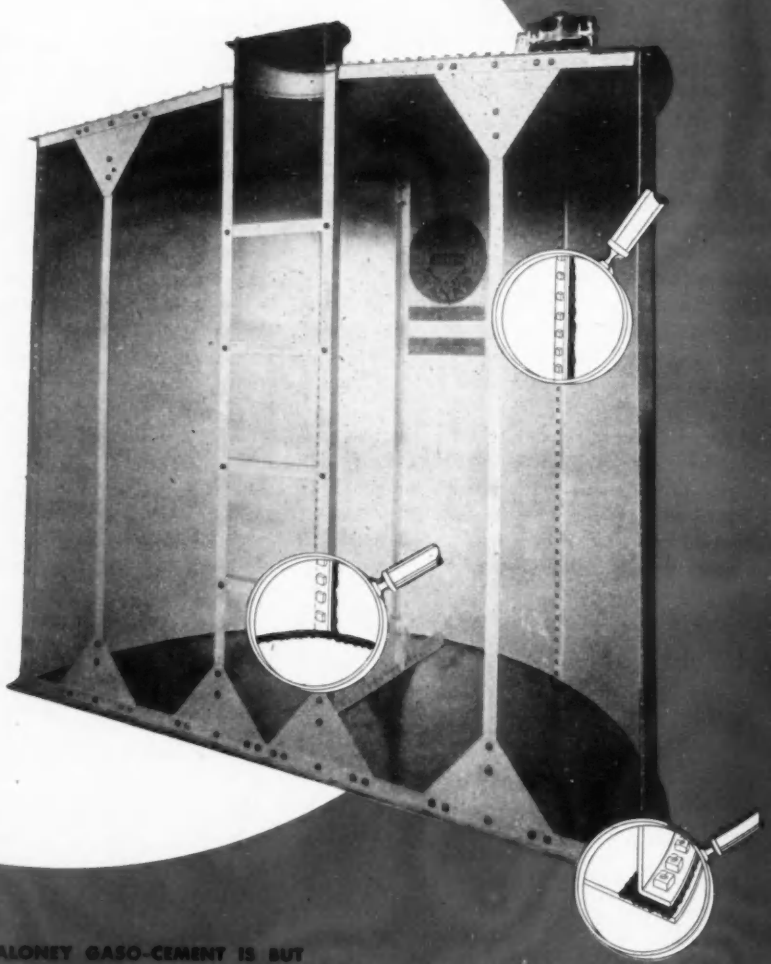

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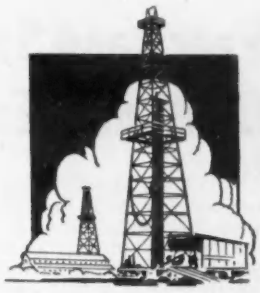


By BERTRAM F. LINZ, Washington Correspondent

OIL developments in Washington last week provided a good picture of the over-all situation.

Conference on Oil Pact—Government representatives and members of the PIWC national oil policy committee appeared before the Senate foreign relations committee, behind closed doors, to give their views on the Anglo-American oil agreement, now in course of revision to meet industry demands, and were seen as paving the way for prompt and favorable action when the pact comes before the Senate for ratification.

Committee Studying Canol—Canol again came into the picture as the Mead committee investigating war expenditures began a study of information on operating results of the project obtained from War Department officials in recent not expected to be unduly appreciative of the undertaking. It is understood the Army will abandon the project that was built for "strategic war purposes."

Record Production Asked—PAW called on the states for production of a new record-making 4,793,350 barrels daily of crude oil during March, with well over half of the 36,550 barrels increase over this month centered in Texas.

Lend-Lease Oil Shipments—A report on lend-lease operations disclosed that oil shipments to Allied and associated nations had topped the $1,500,000 mark by the end of last year. Indications are that shipments will continue at a very high rate until the defeat of Germany.

FPC Gas Hearing May 1—The Federal Power Commission announced that it would get actively into its investigation of natural gas on May 1, when it will open hearings at Kansas City which will be followed by hearings in other sections of the producing area.

Keymen Out of Draft—Selective Service and War Manpower Commission set up machinery for protecting a "hard core" of men under 30 years of age in key posittions in the oil and other war industries with PAW authorized to certify to local draft boards the names of men who should be given the greatest consideration for occupational deferment because of their essentiality to the war programs.

Tubular Goods Allocation—Second quarter allotment of tubular goods, worked out by WPB, gives drillers slightly more than 260,000 tons or 26,000 tons less than estimated requirements. Reviews of the situation every 30 days is planned so that quick changes could result from improvement in war conditions.

High-Octane Expansion—Military demands have caused a new expansion in the aviation gasoline program, PAW Administrator Ickes announcing that five new plants are to be built and even more are under consideration.

Second Quarter Tubular Goods Under Needs But Above Early Expectation

Slightly more than 260,000 tons of tubular steel will be available for drilling during the second quarter this year, under allocations worked out by the War Production Board for PAW.

Cut approximately 26,000 tons from the original estimate of 287,000 tons, the allocation will mean inability to drill 640 of the 6900 new wells programmed by PAW for the coming quarter, unless additional supplies can be found in inventories around the country.

The severe competition of the programs of several agencies for tubular goods considerably in excess of frozen available supply, made it impossible to expand PAW's allocation. However, it was disclosed, other agencies, including the military, also had to take cuts in order that the most pressing demands, among them that of the oil industry, might be more closely met.

PAW is understood to have received allocations of full estimates of copper and aluminum and to be, in respect to most materials other than tubular steel, in good shape for the second quarter.

There is no indication that the tubular goods situation will improve before the fourth quarter unless the European war is wound up earlier. While hopeful of an early end of the war, officials in Washington, mindful of what happened last fall after many predicted a quick finish, are making their plans on the basis of continued fighting.

However, WPB and the claimant agencies have arranged to review the situation every 30 days, so that if there is any change for the better, it can be quickly translated into additional material for the oil and other programs. By the fourth quarter it is expected that additional facilities will be available which will provide increased supply.

Meanwhile PAW is expected to urge the industry to dip into inventories for as much tubular goods as possible in order to drill as close to the programmed number of wells as can be attained under current conditions. No estimate is available, however, of the amount of material that can be brought into use in this way.

Gas Hearing Postponed

The Federal Power Commission has postponed until March 7 and transferred to Chicago the hearing scheduled for March 2 in Washington in the application of the Central Illinois Public Service Company for an order directing Panhandle Eastern Pipe Line Company to extend its pipe line to connect with the former's distribution system and serve it with sufficient gas to meet its requirements in four eastern Illinois communities.

Texas-California Rail Shipments to Be Hiked

Tank car shipments of West Texas sour crude to California refineries is to be stepped up to 19,500 barrels daily in March. The movement is currently averaging about 12,000 barrels daily with 8000 to 10,000 barrels daily being consigned to the General Petroleum Corporation's Torrance refinery, while the remainder is supplying small plants of the Operators Oil & Refining Company at Rioco and the Pathfinder Petroleum Company at Los Alamitos.

Negotiations are pending for the diversion of 2000 barrels of sweet crude daily from the Fullerton field by tank cars to refineries in the middle west in order to relieve congestion on Magnolia Pipe Line Company's sweet crude unit. If this movement materializes the oil will be delivered to Atlantic Pipe Line Company's Midland rack, which is handling the west coast shipments and also 11,500 barrels of regular Permian basin crude daily to Pittsburg.

Peace and Security of World Hinge On Middle East Oil, Senator Says

FUTURE development of the world, and its peace and security, may depend upon the development of the Middle East petroleum resources, according to Senator Harold H. Burton of Ohio, member of a special Senate investigating subcommittee which has just returned from that area.

Reporting to the Senate February 19, on the results of the trip, Burton declared that the subcommittee found that at the present time the refinery and pipe line facilities of the Persian Gulf area are being put to full use, and every possible effort is being made to expand them so that still further use may be made of them in connection with the war.

Submitting his personal views, as had his colleague, Senator James M. Tunnell of Delaware, previously, Burton asserted that "the development of this area of new wealth of inestimable value derived directly from petroleum will supply to it the very life blood of modern industry and transportation" and will contribute to the recovery and development of Europe, Africa and Asia as a whole, "and to the market for automotive machinery produced not only in Europe, but in America."

"In the days of economic stress confronting the world following the war, these great pertoleum resources will be, therefore, of inestimable value, not only to the localities in which they are placed, but also to the world as a whole, and to the United States in particular," he said.

"Coupled with this economic value of this area is its obvious importance to the security and peace of the world," he pointed out. "The prize represented by this great natural wealth is attractive to the great nations of Europe and Asia; and unless this wealth be made available to the world on some basis that is just and fair to all concerned, it almost inevitably will lead to international controversy, probably leading to armed conflict.

"The presence of this resource, therefore, confronts the United States and all the other nations of the world with an extraordinary responsibility of bringing into operation at the earliest practicable date such positive and vigorous measures of international policy as are represented by the proposal of the Senator from Michigan (Vandenberg) for an early treaty among the great Allied Nations for the demilitarization of Germany and the establishment at the earliest practicable date of a general international organization based on the principle of the sovereign equality of all peace-loving states open to membership by all such states, large and small, for the maintenance of international peace and security."

First FPC Natural Gas Hearing in Kansas City

The first public hearing of the Federal Power Commission on the conservation and utilization of natural gas has been set for 10:30 a.m., May 1, in Kansas City, Missouri. The commission has found it advisable to hold hearings in the principal gas producing regions in order to provide greater opportunity for participation in such hearings with a minimum of travel. The conservation authorities of several states have in preparation statistical and other information which they desire to submit in the investigations.

The hearings are in furtherance of the investigation instituted on September 22, 1944, by the commission on its own motion into the extent and probable life of the nation's natural gas reserves; present and prospective measures for preventing waste and prolonging the life of such reserves; the present and probably future utilization of natural gas for domestic, commercial and industrial purposes; the extent, character and results of the competition of natural gas with other fuels; and such related matters as may be helpful in administration of the Natural Gas Act or in determining what additional legislation, if any, should be recommended.

Weather Continues to Cut Into Eastern Oil Receipts

Shipments of fuel oil and other civilian oil products into District 1 consuming centers during the first two weeks of February fell about 50,000 barrels a day below programmed schedules, it was disclosed last week by Deputy Administrator Davies.

Even though it is expected that rail movements will show an improvement for the last half of the month, Davies admitted there is no possibility now of meeting the original transportation program.

How badly PAW was hit by the recurring bad weather which repeatedly tied up transportation during the month was evidenced by a report on the rail movement for the week ended February 10 which showed that while tank car deliveries of 535,000 barrels daily were scheduled only 425,155 barrels a day moved out of shipping terminals. For the week ended February 17, shipments advanced to 487,826 barrels daily but, Davies said, "we have a long way to go before we catch up with the stock losses incurred when railroad, barge and truck traffic was snarled by bad weather."

Meanwhile, another spell of cold weather necessitated the Office of War Utilities to declare a second ban on the use of natural or mixed gas by places of amusement in seven Appalachian states and the District of Columbia for a period of two days from night fall February 19 to the same time February 21. Earlier in the month, a three-day ban was imposed to conserve restricted supplies of natural gas for war industries in Ohio, Kentucky, West Virginia, western Pennsylvania, western New York, Virginia, and Maryland.

As the ban was lifted, OWU Director Edward Falck warned that similar action would have to be taken again if there was more very cold weather.

"There is only about a month of cold weather to go," he said, "but we are at the bottom of the barrel so far as gas supply for meeting any sudden peak demand is concerned."

Petroleum Looms Large in Lend-Lease Transactions

Total exports of petroleum under lend-lease up to January 1 of this year amounted in value to $1,568,184,000, it was disclosed February 20 by FEA Administrator Leo T. Crowley in his quarterly report to Congress. Of this total, Crowley said, $845,977,000 worth was provided last year.

The report showed that two thirds of the oil and products exported under lend-lease went to the United Kingdom. Figures on shipments to individual areas were compiled only up to December 1, last, at which time they totaled $1,435,000,000, of which $1,071,000,000 was to the United Kingdom, $66,000,000 to Russia, $78,000,000 to Africa, the Middle East and the Mediterranean area, $207,000,000 to China, India, Australia and New Zealand and $13,000,000 to other countries, including Canada.

"Petroleum products have constituted 5 percent of our total lend-lease transfers," Crowley reported. "Two thirds of lend-lease petroleum shipments during 1944 consisted of aviation and motor gasoline. Part of this has been used by our own air forces operating from the United Kingdom.

"Although lend-lease petroleum shipments for use by our Allies have been large, they have accounted for less than one tenth of U. S. production."

WPB Gives High Priority For Additional Gas Lines

Granting of AA-1 priority ratings for two additional natural gas projects designed to increase deliveries of southwestern gas into the Appalachian area by next winter was announced by the WPB February 23. The new facilities, together with the Panhandle Eastern Pipe Line Company project, will increase the supply of gas in that area by 110,000,000 cubic feet a day.

One project calls for the construction of approximately 140 miles of 24-inch line by the United Gas Pipe Line Company from the Carthage Field, Texas, to Tennessee Gas and Transmission Company's line at Monroe, Louisiana, at a cost of $7,000,000, and the other involves the addition of four compressor stations on T-G-T line from Monroe to West Virginia at a cost of $5,000,000. Through these facilities, Tennessee will be able to deliver an additional 60,000,000 cubic feet of gas daily into the Appalachian area.

Application for authority to construct the facilities have been filed by the two companies with the Federal Power Commission, WPB said.

Elk Hills-Los Angeles Pipe Line Is Completed

Completion of the crude pipe line from the Elk Hills naval reserve to refineries at Los Angeles, was announced last week, by PAW, which also reported that Gulf Refining Company's 63-mile 8-inch crude line from the Keystone-Ellenburger field to Midland, Texas, is practically finished and will be brought into service during coming month.

PAW disclosed that pipe line deliveries in District 1 reached an all-time high in January, averaging 744,047 barrels daily, consisting of 421,196 barrels of crude and 322,851 barrels of products.

Military Demand for High-Octane Gasoline Results in More Expansion

A new expansion of the aviation gasoline program is being started by PAW in response to rising demands from the Army and Navy for 100-octane fuel, it was announced by Administrator Ickes February 23. Construction of five new plants has been scheduled and proposals for several more are under consideration, Ickes said.

New plants, to be built by private capital at a cost of $78,000,000, include two for Standard Oil Company (Indiana) at Whiting, Indiana, and Sugar Creek, Missouri, and one each for The Texas Company at Lockport, Illinois; Leonard Refineries, Inc., at Alma, Michigan, and Shell Oil Company at Houston.

It was revealed that very substantial increases in 100-octane production have been asked by the armed services, although production has been above 500,000 barrels daily since last October.

"We have been helped by diversion of some components from the synthetic rubber program, but are informed that this probably will continue only six months instead of two years as we contemplated." Deputy Administrator Davies explained, in discussing the situation. "In fact, it is indicated that an expanded rubber program may cut into our supply of cumene, a blending agent which has accounted for 11.6 percent of our increase in 100-octane productions."

Keymen and Draft

Adoption of a plan approved by the Office of War Mobilization to cover the making of requests for deferment of a limited number of men under 30 years of age who hold key positions in war industries was announced last week by Selective Service Director Lewis B. Hershey, and War Manpower Commission Chairman Paul V. McNutt.

Under this plan, government agencies responsible for procurement and production of war goods and for maintenance of essential services, including PAW and Rubber Reserve Company, will be authorized to certify to local boards the names of men 18 through 29 years of age who, in the interest of the war effort, should be given the greatest consideration for occupational deferment from military service.

The new procedure, the two agency executives said, will permit a "very limited" number of all men who were classified as 2-A or 2-B at the beginning of this year to be certified to local boards as essential on their civilian jobs.

Denham Appointed

Appointment of H. G. Denham as manager of sales for Arabian American Oil Company was announced in Washington February 21 by F. A. Davies, president of the company.

Although Arabian American, owned jointly by Standard Oil Company of California and The Texas Company, maintains its headquarters in San Francisco, Denham will spend much of his time at the company's New York offices, Davies said.

Oil Tax Increase

Representative Jack Lucas has introduced a bill in the Texas legislature providing for a slight increase in the oil tax along with higher rates on sulphur and a new tax on salt. The bill is expected to form the framework for an omnibus tax bill if the legislature finds it is in need of funds when appropriations are finally worked.

OFFICERS OF LOS ANGELES NOMADS

Nineteen forty-five officers of the Los Angeles chapter of Nomads are shown above, left to right, as follows: Seated—Roland E. Smith, export representative, regent; Elmer R. Smith, export representative, president; Henry W. Pullman, Baker Oil Tools Inc., regent. Standing—Custer Morrow, The Lummus Company, deputy sergeant at arms; J. V. Robinson, Miller-Robinson Company, secretary; C. M. Byron, Baker Oil Tools Inc., assistant secretary; Waldo Moore, The Cavins Company, assistant treasurer; Hi Cassidy, The McCarty Company, sergeant at arms; Fred Tyler, Reed Roller Bit Company, treasurer, and William McGraw, Western Pipe & Steel Company, vice president.

Control Strengthened for District 1 Naphtha Inflow

Controls over naphtha and natural gasoline were strengthened February 19 with issuance of an order requiring PAW approval for any movement of those commodities into District 1 by either rail or inland waterways.

The new order will become effective March 1, and will make the importation of all components to be used for blending into motor fuel in the East Coast states subject to PAO-5 provisions.

"Unscheduled shipments into the East Coast area of naphtha and other petroleum liquids suitable for blending into motor fuel have resulted at times in an unbalanced distribution of motor fuel in District 1," Deputy Administrator Davies explained. "The amended order will enable PAW to make certain that every gallon of gasoline or gasoline components moving into East Coast states is distributed most effectively to meet the needs of the area as a whole."

Gowanloch Co-Author

In the article "Shrimp Don't Mind Dynamite" that appeared in THE OIL WEEKLY, February 19, one of the co-authors' names was misspelled. The name should have been James Nelson Gowanloch, chief biologist, Division of Wildlife and Fisheries, State of Louisiana. Readers who index articles from THE OIL WEEKLY, should make the necessary correction.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED February 23	February 17
Alabama	250	250
Arkansas	82,200	81,600
California	901,750	895,500
Colorado	10,050	9,550
Florida	25	30
Illinois	205,800	204,000
Indiana	12,500	13,050
Kansas	272,850	271,350
Kentucky	31,100	30,300
Louisiana	363,250	362,750
North Louisiana	68,750	68,250
South Louisiana	294,500	294,500
Michigan	51,100	45,250
Mississippi	51,450	51,500
Missouri	100	100
Montana	22,970	21,660
Nebraska	950	900
New Mexico	104,750	104,750
New York	13,750	13,300
Ohio	7,250	6,750
Oklahoma	368,500	366,300
Pennsylvania	33,200	32,100
Tennessee	35	35
Texas	2,146,450	2,146,450
Upper Gulf Coast	562,050	562,050
East Texas Field	392,000	392,000
Rest of Eastern Texas	144,200	144,200
Lower Gulf Coast	246,650	246,650
Southwest Texas	79,900	79,900
South Central Texas	20,500	20,500
West Texas	464,350	464,350
North Texas	148,700	148,700
Panhandle	88,100	88,100
West Virginia	7,850	7,100
Wyoming	99,550	99,550
Total United States	*4,787,680	4,764,125

* New all time peak.

Bureau of Mines Report

Total stocks, foreign and domestic, February 17, as reported by the Bureau of Mines were: 220,060,000 barrels with a daily average production of 4,781,000; and runs to stills 4,787,000.

Record United States Production Is Requested for March by PAW

The Petroleum Administration for War asked for a record petroleum liquid production rate for March, of 5,118,760 barrels daily, including 4,793,350 barrels of crude oil. February daily average output was set at 5,074,850 barrels, 43,910 barrels under that asked for next month.

Authorizations for March call for an increase in crude oil amounting to 36,550 barrels daily, and 7360 barrels of natural gasoline and other petroleum liquids.

Principal increases are requested from Texas, Oklahoma and California.

The certified March rate of petroleum liquids production for the various states as compared with February totals, follows:

District One: New York, 13,000, unchanged; Pennsylvania, 40,300, reduced 100 barrels; West Virginia, 14,700, reduced 300 barrels.

District Two: Illinois, 210,000, unchanged; Indiana, 12,000, unchanged; Kansas, 278,000, reduced 1000 barrels; Kentucky, 35,200, reduced 600 barrels; Michigan, 47,700, reduced 150 barrels; Nebraska, 1000, unchanged; Ohio, 8600, increased 100 barrels; Oklahoma, 391,000, increased 2500 barrels.

District Three: Alabama, 300, unchanged; Arkansas, 85,200, unchanged; Louisiana, 400,000, increased 3000 barrels; Mississippi, 53,000, unchanged; New Mexico, 109,900, decreased 200 barrels; Texas, 2,316,000, increased 26,000 barrels.

District Four: Colorado, 9500, unchanged; Montana, 23,300, unchanged; Wyoming, 103,600, unchanged.

District Five: California, 966,160, increased 14,360 barrels.

Texas March Allowable 2,320,558 Barrels Daily

An allowable of 2,320,558 barrels daily for the month of March is provided in a new Railroad Commission order issued last week. This figure includes 159,883 barrels of distillate and condensate. The total exceeds the PAW certification by 4558 barrels daily.

The fields generally will be permitted to produce 25 days. Panhandle is exempt from shutdown and East Texas is to produce 25 days. This will mean an allowable of 387,184 barrels daily for that field in March.

On February 17, the East Texas allowable was 394,048 barrels and the lower March figure results from the production on 25 of 31 days, a lower net figure than when the field produced on 23 of the 28 days in February. Several increases were ordered in West Texas to meet the request of PAW. Nominations filed at the statewide hearing totaled 2,335,098 barrels daily for March, which was 5281 barrels above the February figure.

PAW asked that Texas produce 2,326,000 barrels of oil daily during March. Of this, 2,160,000 barrels was crude oil, an increase of 20,000 barrels over February request. PAW specified that this oil should be produced from West Texas Districts 7-C and 8.

In explaining increased March certification for West Texas, PAW has pointed out that additional tank cars have been made available to move the West Texas crude to the Eastern Seaboard. Continuation of the tank car movement of a minimum of 15,000 barrels daily during March to the Pacific Coast has increased the outlet for the area, "where some productive capacity in excess of maximum efficient rates still exist."

"Crude oil stock levels of West Texas type crude appear to be at the minimum levels desired for flexibility of operations, and the increased certification is necessary to provide current production to meet requirements," it was said.

A sharp decline in the average bottom hole pressure for the East Texas field was reported. The average weighted pressure dropped 3.18 pounds during January, and the mathematical average dropped 6.41 pounds. Production during the month averaged 387,299 barrels per day.

It was pointed out that a further decline is anticipated in February, as the high rate of production continued, despite an increase of salt water injected by 31,836 barrels daily during January. Commission Chairman Olin Culberson said that the high flow would continue so long as PAW demanded.

The commission's plan of increasing its engineering staff to include 10 engineers at $250 monthly, eight junior engineers at $300, and four senior engineers at $4000 yearly. All would have to be graduates of accredited schools. Industry representatives at the hearing indicated they would support the plan when it is presented to the legislature.

Industry Objections to Oil Pact Said Overcome

PAW officials and members of the PIWC national oil policy committee spent most of February 22 closeted with the Senate foreign relations committee in an informal hearing on the progress of the Anglo-American petroleum agreement.

Government officials explained the new drafts of the pact which they have drawn up on the basis of the industry committee's recommendations for revision, and the committee representatives, in turn, said what they thought of the proposal as now stated. State Department officials were present but did not express their views, explaining that they had not yet had an opportunity to study the PAW draft, and it was agreed that they should return for another meeting with the Senate group next month.

Following the conference, Chairman Tom Connally said that objections raised to the original agreement now appear to have been overcome. Some minor points remain to be worked out, Connally indicated, but he said the industry representatives, "in the main," are now in favor of the agreement.

The senator indicated that in his view the pending agreement is merely a "preliminary treaty which would be followed later by a multi-lateral treaty in which it is hoped other nations, including Russia, would join."

Abandonment of Canol Said Likely by the Army

The Canol project is due to break into the headlines again, the head committee on investigation of war expenditures having completed a series of closed hearings at which War Department officials reported the operating results of the undertaking. Whether public hearings will be held has not been decided by the committee, but it was said a report will be prepared.

Later in the week, congressional sources said the Army is ready to close down the Canol project and write off much of its investment as a strategic War expenditure.

War department representatives were reported to have said present plans call for abandonment of operations after a resurvey of Canol's potentialities this spring, unless the combined chiefs of staff direct to the contrary.

Improvement in conditions since the project was initiated makes possible the assignment of tankers to transport oil to Skagway, where it can be distributed by pipe line, more cheaply than it can be produced and refined in the Canol project, according to Senator Homer Ferguson of Michigan, a member of the Mead committee. In other quarters it was said that if the department comes to Congress for more money to operate the project, it will be strongly opposed.

Production and Refinery Equipment Off to China

Opening of the Ledo (Stilwell) Burma-China road will permit the expedition of materials for the drilling of new wells and the increasing of refinery capacity in China, it was declared by PAW last week.

But security, PAW said, forbade any disclosure of the program of its expected results, and the most information it could make available was that it has been working with the Chinese government on plans for increasing China's oil production.

Bill Enables Montana to Join Interstate Compact

A bill has passed the Montana House of Representatives authorizing that state to join with others in an Interstate Compact to conserve oil and gas. Under its provisions procedure for withdrawal from the compact is set out, the governor is named as official representative to the compact, and he is authorized to appoint an assistant representative. Expenses of the representative incurred in connection with the compact are also authorized.

South Texas Chart

Stratigraphic relationships of the oil-producing lower Cretaceous formations of East and South Texas have been summarized in a chart published last week by the Geological Survey, designed to be of assistance to geologists concerned with the selection and identification of promising lithologic units within those formations for testing by deep wells.

The formation is incorporated in Preliminary Chart 8 of the oil and gas investigations series, available at 50 cents each in Washington and Tulsa.

API Announces Reserves Figures

Estimate shows more new supplies of petroleum found during year than was consumed, a gain of 389 million barrels being recorded despite heavy production mark

DESPITE the production of substantially larger quantities of crude oil than ever before and the wartime curtailment of drilling operations to far below normal levels, the oil industry of the United States found more new supplies of petroleum than was consumed, according to the annual report of the American Petroleum Institute committee on petroleum reserves. The committee's estimate of proved petroleum reserves for the United States stood at 20,453,231,000 barrels at the end of 1944 in contrast with 20,065,152,000 barrels a year ago. This is the largest quantity of proved petroleum reserves in history of the nation.

More than two billion barrels of new petroleum reserves are shown by the committee's report to have been discovered in the Unitd States during 1944 by the discovery of new producing pools and the further development of older pools. The committe's exact estimate of new oil proved to exist during the year amounts to 2,067,500,000 barrels. This compares with the record production of 1,678,000,000 barrels during the year. Therefore, a net gain of 389 million barrels occurred in the proved oil reserves of the country.

It is very significant to note that the committee's estimate of proved crude oil reserves has increased by nearly one billion barrels since the country went to war in December, 1941. This means the United States oil industry has been able to find substantially more new oil than it has produced, although crude oil production in 1944 was 24.2 percent more than in prewar 1941. This remarkable record is made more noteworthy because it has been accomplished in the face of wartime steel and manpower shortages, which have held drilling operations far below normal levels. In the six years preceding the war, the United States drilled 30,000 wells annually. Last year only 24,451 wells were completed, which was the largest number since the start of the war.

Fields Further Developed

As usual most of the new oil found is credited to additions resulting from further development of fields discovered in previous years. In 1944 the new reserves resulting from additional development of previously found fields amounted to 1,556,000,000 barrels. New reserves resulting from the discovery of new pools during the year, 511 million barrels, made up the balance.

The volume of new oil accredited by the committee to new fields discovered during 1944 is worthy of special comment, being almost twice as great as the quantities of the preceding two years, and the highest since 1938.

Texas, with reserves of 11,375,480,000 barrels at the end of the year, had 55.6 percent of the United States oil reserves. California, Louisiana, Oklahoma, Kansas, Wyoming and New Mexico followed in the order named. Texas also found more new oil than any other state, being credited by the committee with the discovery of 798,316,000 barrels of new petroleum. However, the state's volume of proved reserves registered only a modest gain of 50 million barrels, in view of the unusually large amount of oil withdrawn from Texas fields during the year.

California, second largest site of proved unproduced crude reserves and nearest large supply source for Pacific warfare, just barely maintained its volume of reserves in the face of record production. The state found 319½ million barrels of new oil, only 7¾ million more than it produced. California's reserves at the end of the year were calculated by the committee to total 3,344,552,000 barrels, or less than one third of top ranking Texas.

Mississippi Is Leader

The largest increase in crude occurred in Mississippi. This state was credited by the committee with the discovery of 186½ million barrels of new oil, or 170 million more than its 1944 production. Consequently, this comparatively new producing state was estimated to have a proved remaining reserve of 209 million barrels. Due to the discovery of several important new fields, most of Mississippi's additions to its proved reserves were in new fields discovered during the year. The state's new fields accounted for 179½ million barrels of new oil, whereas additional development of older fields contributed less than 7 million barrels. Consequently, it can be said that extensive development of newly discovered Mississippi fields was largely responsible for the nation's better showing in volume of oil resulting from new pools discovered in 1944.

Louisiana was another state that found

Estimated Proved Petroleum Reserves in the United States

(Barrels of 42 U. S. Gallons)

	Proved Reserves as of Dec 31, 1943	Changes in Proved Reserves Due to Extensions (New Oil)* and Revisions During 1944	Proved Reserves in New Pools Discovered in 1944†	Total New Oil Discovered (Columns 2+3)	Production During 1944 (Estimated)	Proved Reserves as of Dec. 31, 1944 (Columns 1+4 Less Column 5)	Change in Reserves (Difference Between Columns 1 and 6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Alabama			360,000	360,000	43,000	317,000	+317,000
Arkansas	296,929,000	20,423,000	5,148,000	25,571,000	29,441,000	293,059,000	—3,870,000
California	3,336,823,000	242,575,000	76,925,000	319,500,000	311,771,000	3,344,552,000	+7,729,000
Colorado	45,111,000	46,025,000	647,000	46,672,000	2,960,000	88,823,000	+43,712,000
Illinois	294,622,000	100,661,000	2,727,000	103,388,000	77,296,000	320,714,000	+26,092,000
Indiana	31,039,000	3,887,000	1,657,000	5,544,000	5,090,000	31,493,000	+454,000
Kansas	645,852,000	42,431,000	12,498,000	54,929,000	99,030,000	601,751,000	—44,101,000
Kentucky	35,190,000	15,236,000	331,000	15,567,000	9,677,000	41,080,000	+5,890,000
Louisiana	1,483,826,000	107,062,000	112,055,000	219,117,000	129,556,000	1,573,387,000	+89,561,000
Michigan	55,248,000	17,745,000	10,700,000	28,445,000	18,559,000	65,134,000	+9,886,000
Mississippi	38,872,000	6,973,000	179,533,000	186,506,000	16,367,000	209,011,000	+170,139,000
Montana	108,057,000	11,829,000	346,000	12,175,000	8,582,000	111,650,000	+3,593,000
Nebraska	1,000,000				419,000	581,000	—419,000
New Mexico	653,981,000	—54,101,000	2,240,000	—51,861,000	39,556,000	562,564,000	—91,417,000
New York	90,525,000				4,694,000	85,831,000	—4,694,000
Ohio	32,643,000		1,925,000	1,925,000	2,944,000	31,624,000	—1,019,000
Oklahoma	908,618,000	165,547,000	20,844,000	186,391,000	124,747,000	970,262,000	+61,644,000
Pennsylvania	137,323,000				14,185,000	123,138,000	—14,185,000
Texas	11,324,954,000	740,213,000	58,103,000	798,316,000	747,790,000	11,375,480,000	+50,526,000
West Virginia	43,839,000				3,084,000	40,755,000	—3,084,000
Wyoming	499,394,000	89,636,000	25,269,000	114,905,000	32,569,000	581,730,000	+82,336,000
Miscellaneous‡	306,000	50,000		50,000	61,000	295,000	—11,000
Total United States	20,064,152,000	1,556,192,000	511,308,000	2,067,500,000	1,678,421,000	20,453,231,000	+389,079,000

* Extensions greatly exceed revisions. † Only a limited area is assigned to each new discovery even though the committee may believe that eventually a much larger area will produce, for in this report we are concerned only with actually proved reserves. ‡ Includes Florida, Missouri, Tennessee, Utah and Virginia,.

Summary of Committee's Annual Reports Covering Period 1937-1944

(Barrels of 42 U. S. Gallons)

YEAR	NEW OIL BLOCKED OUT DURING YEAR			Production During Year	Estimated Proved Reserves as of End of Yaer
	Through Revisions of Previous Estimates and Extensions to Known Fields	Through New Pools Discovered During Year	Total Through New Discoveries Extensions and Revisions		
1936					13,063,490,000
1937	2,792,790,000	928,742,000	3,721,532,000	1,277,664,000	15,507,268,000
1938	2,243,571,000	810,493,000	3,054,064,000	1,213,186,000	17,348,146,000
1939	2,058,455,000	340,667,000	2,399,122,000	1,264,256,000	18,483,012,000
1940	1,607,012,000	286,338,000	1,893,350,000	1,351,847,000	19,024,515,000
1941	1,538,989,000	429,974,000	1,968,963,000	1,404,182,000	19,589,296,000
1942	1,618,925,000	260,051,000	1,878,976,000	1,385,479,000	20,082,793,000
1943	1,202,368,000	282,418,000	1,484,786,000	1,503,427,000	20,064,152,000
1944	1,556,192,000	511,308,000	2,067,500,000	1,678,421,000	20,453,231,000

substantially larger quantities of new oil than it produced. Reserves in this state increased 89½ million barrels, and at the end of the year totaled 1½ billion barrels, to rank third among the states. The state's new oil was about evenly divided between fields discovered during 1944 and additional development of previously found pools.

Wyoming also came through with an important gain in crude reserves, the amount of oil found being 82 million barrels more than poduced. The decline in Oklahoma's discovery rate was checked, with the discovery of 61½ million more barrels of new oil than was produced.

The reserves of Colorado were almost doubled. The discovery of 46½ million barrels of new oil reserves, primarily in development of fields found in previous year, was 43¾ million barrels more than the state produced. Consequently, Colorado's crude reserves at the end of the year were estimated by the committee to be 88¾ million barrels compared with only 45 million barrels 12 months before.

Other states to show gains in volume of crude reserves, or to have found more than they produced, were: Illinois, Indiana, Kentucky, Michigan, Montana, and Alabama. The latter state became the 26th oil producing state during the year and was given a proved crude reserve of 317,000 barrels.

New Mexico Declines

The largest decline in volume of crude reserves ocurred in New Mexico, due to revisions of previous estimates as additional information became available. The committee reported a decline of 54 million barrels in previous estimates of proved reserves in the state and a gain of only 2¼ million barrels in reserves in new pools found in 1944, a net decrease of 51¾ million barrels. In addition, the state produced 39½ million barrels, and this dropped its crude reserves to 562½ million barrels, or 91¼ million barrels less than a year ago.

Another substantial decrease occurred in Kansas, crude reserves the end of the year being 44 million barrels less than a year ago. The state was credited by the committee with the discovery of only 55 million barrels of new oil in contrast with a production of 99 million barrels.

Other states to suffer a loss in volume of known crude reserves, or to find less oil than they produced, were: Arkansas, Nebraska, New York, Ohio, Pennsylvania, and West Virginia.

Proved Reserves Only

The estimates in the API report, as in all previous annual reports of this committee, refer solely to proved or blocked-out reserves of crude oil (including condensate) known to be recoverable under existing economic and operating conditions. Therefore, they do not include:

(1). Oil under the unproved portions of partly developed fields;

(2). Oil in untested prospects;

(3). Oil that maye be present in unknown prospects in regions believed to be generally favorable;

(4). Casinghead gasoline extracted at natural gasoline plants in moderately low-pressure fields;

(5). Oil that may become available by secondary-recovery methods from fields where such methods have not yet been applied;

(6). Oil that may become available through chemical processing of natural gas;

(7). Oil that can be made from oil shale, coal, or other substitutes.

Definitions Given

Proved reserves are both drilled and undrilled. The *proved drilled reserves,* in any pool, include the oil estimated to be recoverable by the production systems now in operation (whether primary or secondary) and from the area actually drilled up on the spacing pattern in vogue in that pool. The *proved undrilled reserves,* in any pool, include reserves under undrilled spacing units which are so close, and so related, to the drilled units that there is every reasonable probability that they will produce when drilled.

In the case of new discoveries, which are seldom fully developed in the first year and in fact for several years thereafter, the estimates of proved reserves necessarily represent but a part of the reserves which may ultimately be assigned to the new reservoirs discovered each year. For a one-well field, where development has not yet gone beyond the discovery well, the area assigned as proved is usually small in regions of complex geological conditions, but may be larger where the geology is relatively simple. In a sparsely drilled field the area between wells is only considered to be proved if the information regarding the geology of the field and the productive horizon is adequate to assure that such area will produce when drilled. The total of *new oil* through discoveries estimated as proved in any given year is comparatively small and the total of *new oil* through extensions is comparatively large. As knowledge of the factors affecting production and well performance becomes available, and as these factors are studied, reserves in older fields can be estimated with greater precision and revised accordingly. Therefore, the oil assigned to new discoveries, plus the oil proved through extensions, comprises the total quantity of the new proved reserves for the year.

Gradual Recovery

The committee again especially stresses the fact that its estimates of proved reserves cannot be used as a measure of the rate at which these reserves can be produced with or without physical waste. Oil cannot be produced from the permeable rocks in which it occurs at any desired rate, because the flow of oil through the pores of the oil-bearing rocks is definitely controlled by physical factors of the reservoir. As a matter of fact, today's *known oil* can be recovered only over a period of many years and at gradually declining annual rates, as has been widely demonstrated by past performance under all kinds of operating conditions. For this reason, those, who, through arbitrary division of the known reserves by any current rate of production or by any anticipated rate of consumption, try to estimate the life of proved reserves of oil, or the rate at which these reserves can be produced, arrive at an incorrect conclusion.

Conservation Measures In New Texas Gas Bill

Bills to insure the Railroad Commission the right to prorate gas in Texas were introduced in the Legislature last week.

The bill places a maximum gas-oil ratio allowance of 2000/1 and a net volumetric displacement factor. Thus, if that ratio is exceeded, the commission may cut the allowable unless the excess gas is returned to the reservoir or used for legally authorized purposes.

The amount of gas used for gas lift would be cut from 10,000 feet to 3,000 feet per barrel of oil unless additional amounts used are processed for gasoline and the residue burned for carbon black after it is reproduced.

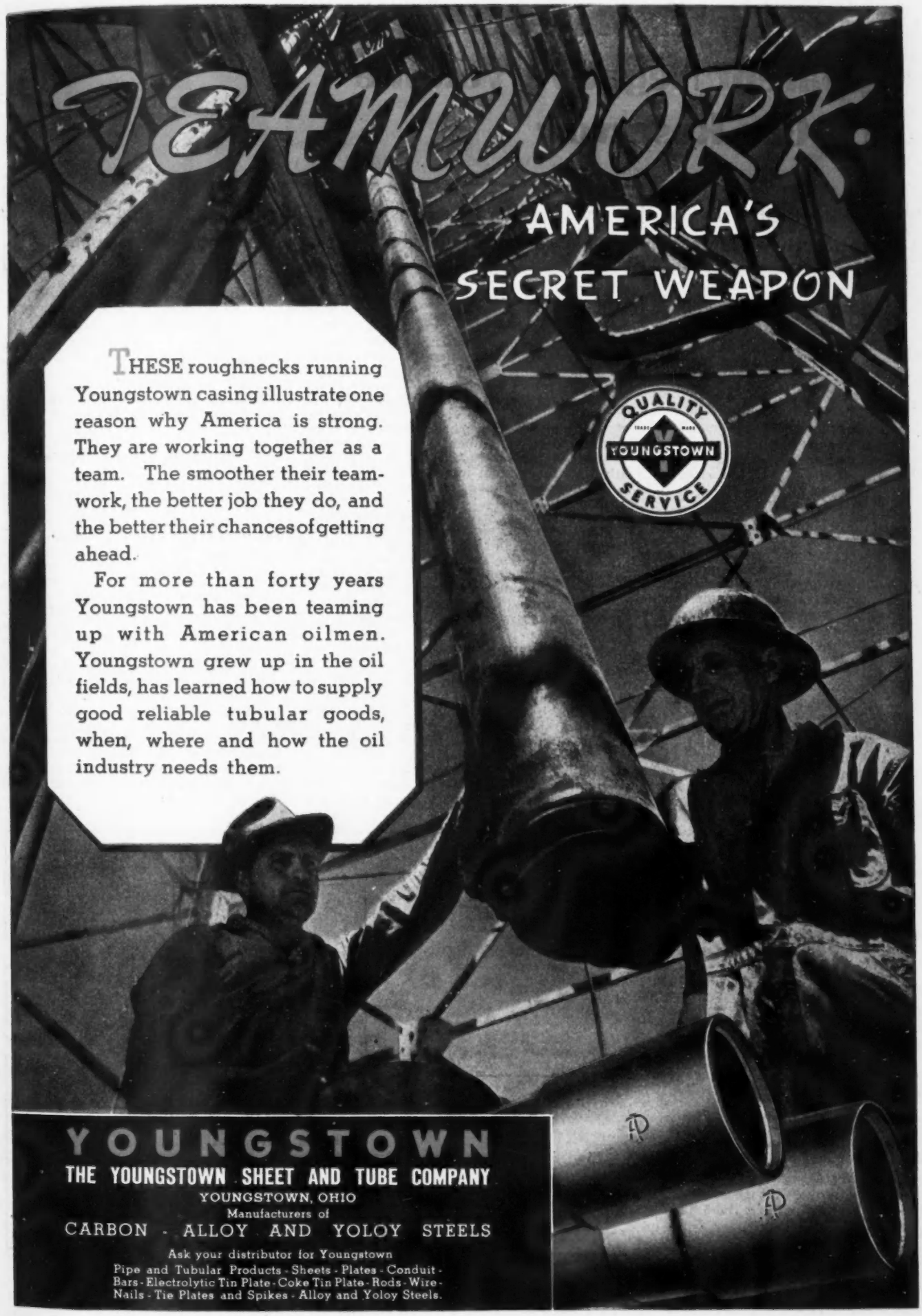
The commission would be authorized to determine market demand for gas to be used for light and fuel and to prorate production on this basis. The first gas considered in setting the supply available would be that produced with oil, reasonably accessible to markets. Production is to be distributed ratably among the wells producing from the same reservoir. Sour gas, as well as sweet gas, would be subject to ratable taking.

Ratable Taking Appears Favored by Louisianans

Louisiana conservation officials are considering a detailed investigation of fields throughout the state with a view to installing a statewide program of proration and ratable taking of gas.

Director P. A. Frye, of the natural gas conservation committee, has requested that Conservation Commissioner Joseph L. McHugh authorize the investigation, and advised that it unanimously recommended proration and ratable taking of gas. He explained that ratable production means allocating existing demands for gas among all wells in a given field, including wells not owned by dominating producers.

The committee also believes, he said, that detailed examination of all gas-condensate fields should be included in the investigation with a view to continuing the program of recycling these fields where possible.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Condensates May Occupy Apparent Negative Volume In a Gas Reservoir

By DONALD L. KATZ and CEDOMIR M. SLIEPCEVICH, of the University of Michigan

Conditions cited showing that under unique conditions removal of condensate could cause dry gas to occupy a larger volume than wet gas occupied at the original pressure and temperature.

IN THE course of preparing a cylinder of natural gas for use in the laboratory, an unusual behavior was observed, The cylinder of natural gas, free from liquid at 75°F. and 2005 pounds per square inch, was cooled at 32°F., about a pint of liquid was drained from the cylinder, and the temperature of the cylinder was brought to 75°F. The pressure on the cylinder *had risen* to 2060 pounds. It would follow that if the liquid, which was removed, were reinjected into the cylinder the pressure would drop.

Thorough consideration of these phenomena indicated that under certain conditions the liquid appears to exhibit an apparent negative volume. Such behavior is common knowledge among those familiar with the properties of hydrocarbon systems but the significance in the handling of wet gases such as in the gas cycling industry may not be obvious. The extraction of liquid in many cycling plants theoretically could be done in such a manner as to return a larger volume of gas to the reservoir than was originally produced.

It is important that the common thermodynamic property of partial volume[1] be distinguished from the term, apparent volume. The partial volume of a constituent in a system is the volume change which occurs in the system when an infinitesimal amount of the constituent is added to the system at constant temperature, pressure, and composition. Apparent volume, on the other hand, is the volume change occurring in a system when a sufficient quantity of a constituent or constituents is added (or subtracted) to the system so that the system undergoes a change in composition at constant temperature and pressure.

This paper will clarify the distinction between the apparent and partial volumes by use of experimental data in the literature on methane-butane mixtures[2,4]. The significance of negative apparent volumes for normal liquids, when they are added or removed from high pressure gases, will be developed.

Additive Volumes for Gases At Low Pressure

At pressures below 50 pounds per square inch, volumes of gases are nearly additive when brought together. If a liquid is condensed from a vapor or gas, the gas is expected to shrink in an amount proportional to the number of moles of liquid removed. Thus, if a gallon of n-pentane is removed from 1000 cubic feet of natural gas at standard conditions the gas would be expected to shrink to 972.4 cubic feet since one gallon of n-pentane has a gaseous volume of 27.6 cubic feet. This behavior is taken for granted in natural gasoline extraction operations but is true only if the pressure is sufficiently low so that the gas behaves the ideal gas laws.

Partial and Apparent Volumes

At higher pressures the law of additive volume does not hold because gases do not behave ideally. If several fluids are brought together at high pressure, the total volume of the mixture may not be equal to the sum of the volumes of the original fluids. Instead the total volume would be equal to the sum of the partial volumes of the individual constituents in the fluids, this total volume may be larger or smaller than the sum obtained by the addition of the volumes of the original fluid. The partial volume of a constituent may be defined as the change in volume which occurs in a mixture when an infinitesimal quantity of that particular constituent is added to a very large quantity of a mixture so that the concentration remains constant under the conditions of constant temperaure and pressure. If the volume of the mixture increases, the partial volume is positive; if the volume of the mixture

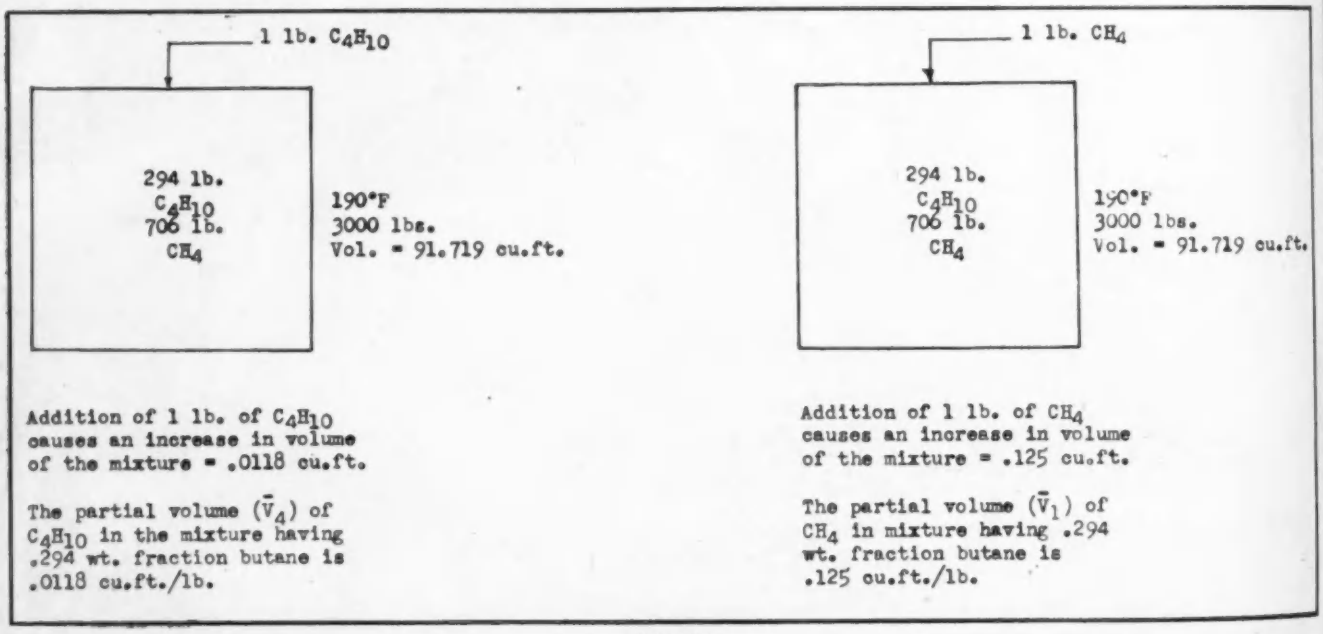
1 lb. C_4H_{10}
294 lb. C_4H_{10} 706 lb. CH_4
190°F 3000 lbs. Vol. = 91.719 cu.ft.
Addition of 1 lb. of C_4H_{10} causes an increase in volume of the mixture = .0118 cu.ft.
The partial volume ($\bar{V}_4$) of C_4H_{10} in the mixture having .294 wt. fraction butane is .0118 cu.ft./lb.
1 lb. CH_4
294 lb. C_4H_{10} 706 lb. CH_4
190°F 3000 lbs. Vol. = 91.719 cu.ft.
Addition of 1 lb. of CH_4 causes an increase in volume of the mixture = .125 cu.ft.
The partial volume ($\bar{V}_1$) of CH_4 in mixture having .294 wt. fraction butane is .125 cu.ft./lb.

FIGURE 1
Example of partial volume

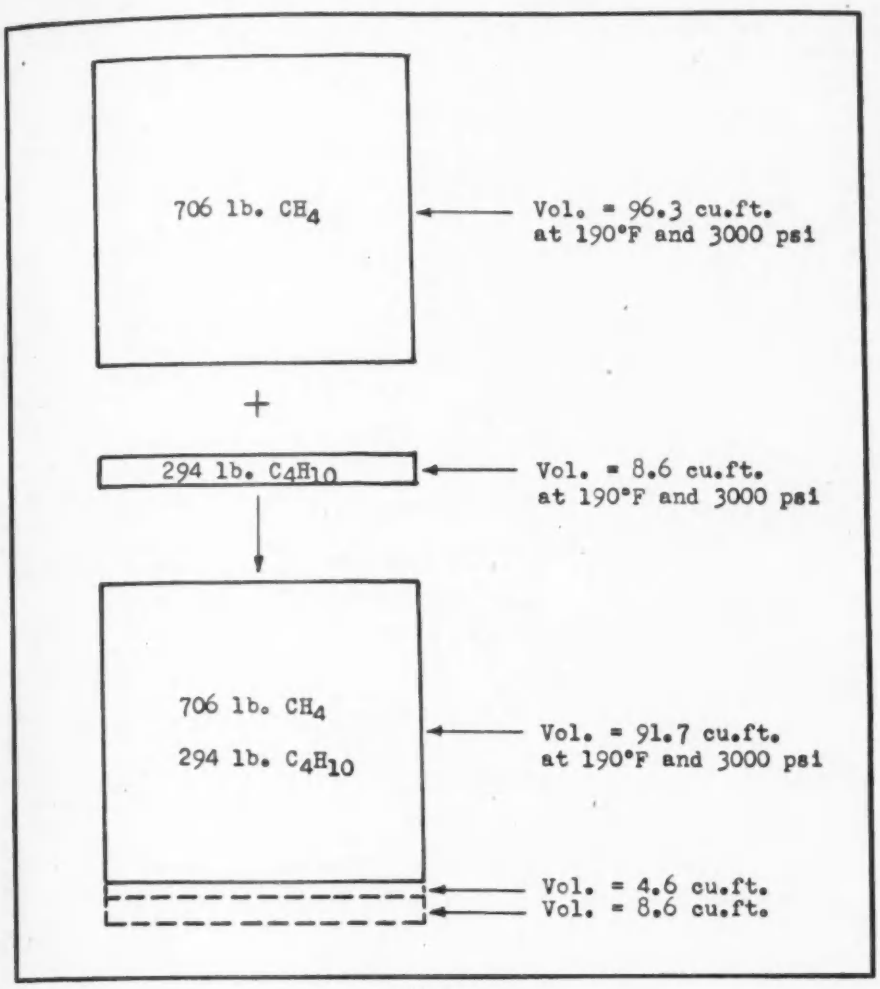

FIGURE 2
Example of apparent volume

decreases, the partial volume is negative. Thus the partial volume of a constituent is dependent on the pressure, temperature, concentration, and type of other constituents present in the mixture.

On the other hand, if a finite quantity of a constituent is added to a finite quantity of a mixture so as to change the concentration of the mixture, the change in volume of the mixture due to the addition of the constituent will be called the apparent volume of the constituent for that concentration range. This discussion relates primarily to the volume changes in a gaseous system when normal liquids are added or removed. Again, the apparent volume may be either positive or negative and will depend on the pressure, temperature, and concentration change.

Partial volumes are illustrated in Figure 1. To a mixture of 294 pounds of butane and 706 pounds of methane, a small quantity of butane may be added to find the change in volume of the system. The volume change when computed as cubic feet per pound added is the partial volume of the butane. Likewise, methane may be added to this system and a partial volume measured.

Partial volumes are thermodynamic properties and have a distinct utility in computing the volumes of mixtures. Thus the volume of the methane-butane mixture may be computed by the following equation:

$$V = 294\ \overline{V}_4 + 706\ \overline{V}_1 \qquad (7)$$

V = Cu. ft. of mixture at 3000 lbs. and 190°F.

$\overline{V}_4$ = partial volume of butane in a methane-butane mixture containing 9.294 wt. fraction butane all at 190°F. and 3000 lbs.

$\overline{V}_1$ = partial volume of methane in a methane-butane mixture containing .294 wt. fraction butane all at 190°F. and 3000 lbs.

$V = 294\ (0.0118) + 706\ (0.125) = 3.469 + 88.250 = 91.719$ cu. ft.

Partial volumes are dependent upon the temperatures, the pressure, the concentration of the constituent, and the nature of the remainder of the mixture. Sage and Lacey[5] have tabulated partial volumes for the volatile saturated hydrocarbons in some of their mixtures.

Apparent volumes, as used in this paper are illustrated in Figure 2. When 294 pounds of butane are added to 706 pounds of methane at constant temperature and pressure, the difference between the volume of the pure methane and the volume of the mixture is called the apparent volume of the butane or the volume which the butane would appear to have under the conditions of additive volumes. In this particular case it is observed that the volume of the mixture is less than the volume of the pure methane by 4.6 cubic feet or the apparent volume of the 294 pounds of butane is —4.6 cu. ft. or —0.0156 cubic feet per pound of butane added.

In equation form, the volume of a mixture equals the pounds of constituent one times its specific volume plus the pounds of constituent four times its apparent volume, or

$$V = 706\ V_1 + 294\ V_{A4}$$

$$(2) = 706\ (0.1364) + 294\ (0.0156)$$

$$= 96.3 - 4.6 = 91.72 \text{ cu. ft.}$$

where

V = volume of 1000 lb. of mixture

V_1 = specific volume of methane

V_{A4} = apparent volume of butane

The apparent volume is an empirical quantity which is defined as the volume which a pure constituent (or mixture) appears to have, assuming additive volumes, when the constituent (or constituents) is added to a second substance. Thus the apparent volumes of normally liquid hydrocarbons, when present in high pressure natural gases, would be the volume change in the gas when these liquid hydrocarbons are added to or removed from the high pressure mixture.

A comparison of partial and apparent volumes for the methane-butane system from Figures 1 and 2 may clarify the differences between them. The following values apply at 3000 pounds and 190° F.:

	Methane (Cu. Ft./Lb	Butane (Cu. Ft./Lb.)
Pure constituent	0.1364	0.0293
Partial volume at .294 wt. fraction butane	0.1250	0.0118
Apparent Volume of butane when added to pure methane to a final concentration of .294 wt. fraction	.....	—0.0156

Behavior of Methane-Butane Mixtures

The variation in the apparent volume of butane in saturated methane-butane vapors has been calculated from the data of Sage, Hicks and Lacey[4]. Table 1 presents the calculated results at 70°F. Figure 3 shows the areas of pressure, temperature, and concentration in which the apparent volume of butane either exceeds the volume of the pure butane at the same temperature and pressure, ($V_{A4} > V_4$, Area 3.), is greater than zero

TABLE 1
Apparent Volumes of Butane in Saturated Methane—Butane Mixtures[4] at 70° F.

Saturation Pressure Lbs. Sq. In. Abs.	Lb. Methane per Lb. Sat. Vapor	Volume of Methane in Pure State Cu. Ft. per Wt. in Col. 2	Volume of Saturated Vapor Cu. Ft./Lb.	Apparent Volume of Butane, Col. 4-Col. 3, Cu. Ft.	Cu. Ft./Lb. of Butane
1	2	3	4	5	6
300	.6265	.7210	.7750	.0540	.1445
500	.7081	.4780	.4911	.0131	.0449
800	.7540	.3020	.3073	.0053	.0216
1000	.7610	.2380	.2401	.0021	.0088
1250	.7510	.1840	.1825	—.0015	—.0060
1500	.7190	.1430	.1390	—.0040	—.0142
1750	.6590	.1092	.1029	—.0063	—.0185
1923	.4820	.0714	.0621	—.0093	—.0179

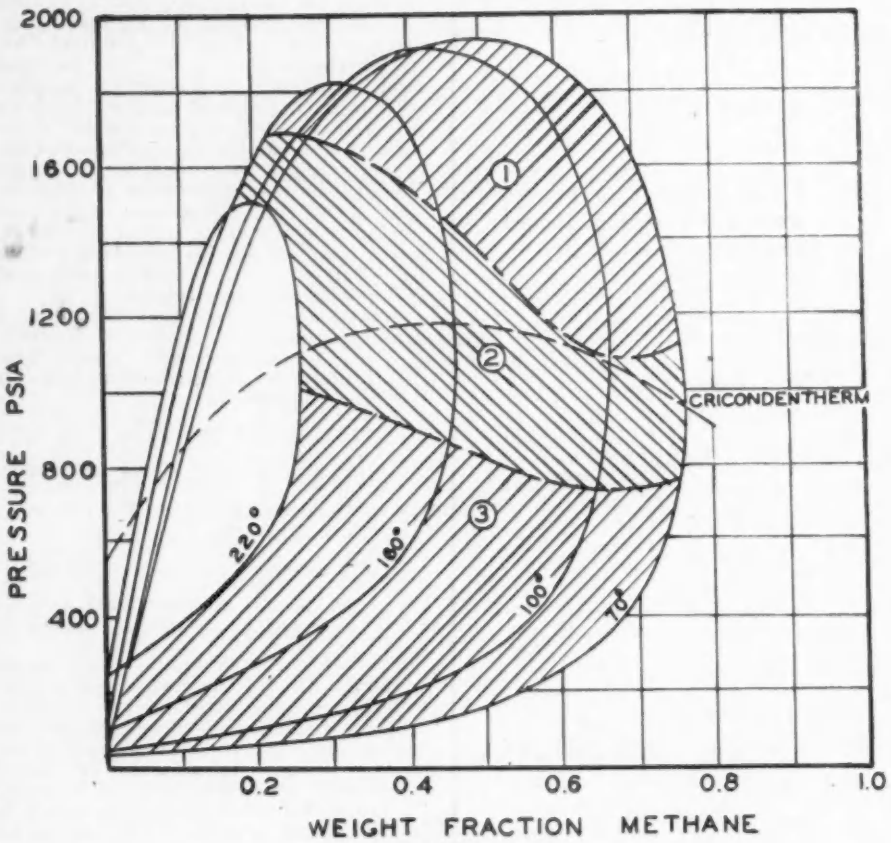

FIGURE 3

Apparent volumes of butane in saturated methane-butane mixtures

but less than the volume of the pure butane ($V_{44}>O<V_4$, Area 2.), or is less than zero or has a negative volume ($V_{44}<O$, Area 1.). The area at low pressure would be expected to have large apparent volumes since it represents the condition of compressed liquid butane in the pure state vaporizing into the mixture. As the pressures increase, causing greater attraction between the molecules and greater deviations from the ideal gas laws, the apparent volumes decrease since the methane becomes more compressible when butane is added. At still higher pressures, the butane addition actually causes the methane to shrink or the butane "sandwiches" itself between the methane and draws the methane into a smaller volume. It should be noted that the examples given above are for saturated or dew point vapors.

The phenomena of apparent negative volumes of butane in the methane-butane system have also been observed in the laboratory for the single phase region surrounding the critical border curve. By means of a Jerguson gauge and mercury pump 0.141 moles of pure butane were added to 0.859 moles of methane at 2000 pounds per square inch and 100°F. while keeping the volume constant and the temperature constant at 100°F. The final pressure reading was 1913 pounds per square inch. The final pressure, as calculated from the compressibility factor plot (6), is 1910 pounds per square inch.

TABLE 2

Calculated volumes of a hydrocarbon mixture at 2810 pounds and 130° F. after removal of successive fractions.

Volume of Mixture Cu. Ft.	Total Moles Present	Composition
1.545	1.0000	Original dew point mixture
1.561	.9619	Original gas with heptanes and heavier removed
1.572	.9173	Original gas with hexanes and heavier removed
1.595	.8541	Original gas with pentanes and heavier removed
1.595	.8412	Original gas with butanes and heavier removed
1.559	.8277	Original gas with propane and heavier removed
1.540	.7920	Original gas with ethane and heavier removed

Apparent Volumes in Complex Mixtures

The apparent volumes of normally liquid hydrocarbons in natural gases may be computed by use of the compressibility factor. The volume of the entire mixture is computed, based on the pseudo critical temperature and pressure of the entire mixture. The volume of the mixture remaining after removal of liquid is computed, based on the pseudo critical conditions of the new composition.

A series of computations were made on a natural gas-natural gasoline mixture[3] of known composition at its dew point of 2810 pounds per square inch and 130°F. The original volume and the volume of the remainder of the mixture after removal of heptanes and heavier, hexanes and heavier, pentanes and heavier, etc. were computed and are tabulated in Table 2. As the heavier constituents are removed, the gas swells, but later shrinks, when the propane is removed. The volume of the methane and ethane is greater than the original mixture although the two constituents only constitute 82.77 mol. percent of the original mixture.

This small change in volume when the heavier constituents are removed is analogous to the small changes in density of high pressure natural gases which takes place when the natural gas enters the two phase region[2].

Compressibility Factor Plot Shows That Apparent Negative Volumes Do Not Occur At Very High Pressures

The trend in negative apparent volumes of condensates with increasing pressures can be predicted from the nature of the compressibility factor plot. The removal of condensates reduces the concentration of the heavier constituents in the residue gas, which in turn decreases the pseudo critical temperature and increases the pseudo critical pressure. Since the reduced temperature is equal to the temperature of the gas divided by the pseudo critical temperature, the reduced temperature of the residue gas would be higher and, the reduced pressure lower than that of the rich gas. Consequently, as shown in Figue 4[6], a lean gas will always have a lower compressibility factor than the rich gas for reduced pressures at or above the region where the lines of constant reduced temperature have reversed their order from that at low pressures. For natural gases, this pressure above which the lean gas has a lower compressibility factor than the rich gas is about 5000 pounds per square inch. Since the moles of lean gas are always less than the moles of rich gas, it follows that the actual volume of the lean gas will be less than the volume of the rich gas whenever the compressibility factor of the lean gas is less. Therefore, the apparent volume of the lean gas will be less than the volume of the rich gas, and the apparent volume of the condensate, about 5000 pounds per square inch, cannot be negative. Expressed mathematically, using the customary gas law:

$$\text{Rich gas: } V_1 = \frac{Z_1\ N_1\ RT}{P} \qquad (3)$$

$$\text{Lean gas: } V_2 = \frac{Z_2\ N_2\ RT}{P} \qquad (4)$$

Solving equations (3) and (4) for V_1

$$V_1 = \frac{Z_1}{Z_2}\ \frac{N_1}{N_2} V_2$$

Since $N_2<N_1$ (removal of condensate lessens the total number of moles present)

and

$Z_2<Z_1$ (true at high pressures — above reduced pressures of approximately 8.0 to 8.5 as shown by Figure 4)

$$\text{Then } \frac{Z_1}{Z_2}\ \frac{N_1}{N_2} > 1$$

and therefore $V_2<V_1$

or the volume of the lean gas will be always less than the volume of the rich gas, at higher pressures. Under this condition, the removal of condensate would cause the high pressure gas to shrink and not increase in volume.

Referring to Figure 4 a general qualitative prediction can be made as to where the phenomenon of apparent negative volume will most likely occur. when the ratio of $\frac{Z_1}{Z_2}$ is less than the ratio of $\frac{N_2}{N_1}$ (which is always less than one) the apparent negative volume of

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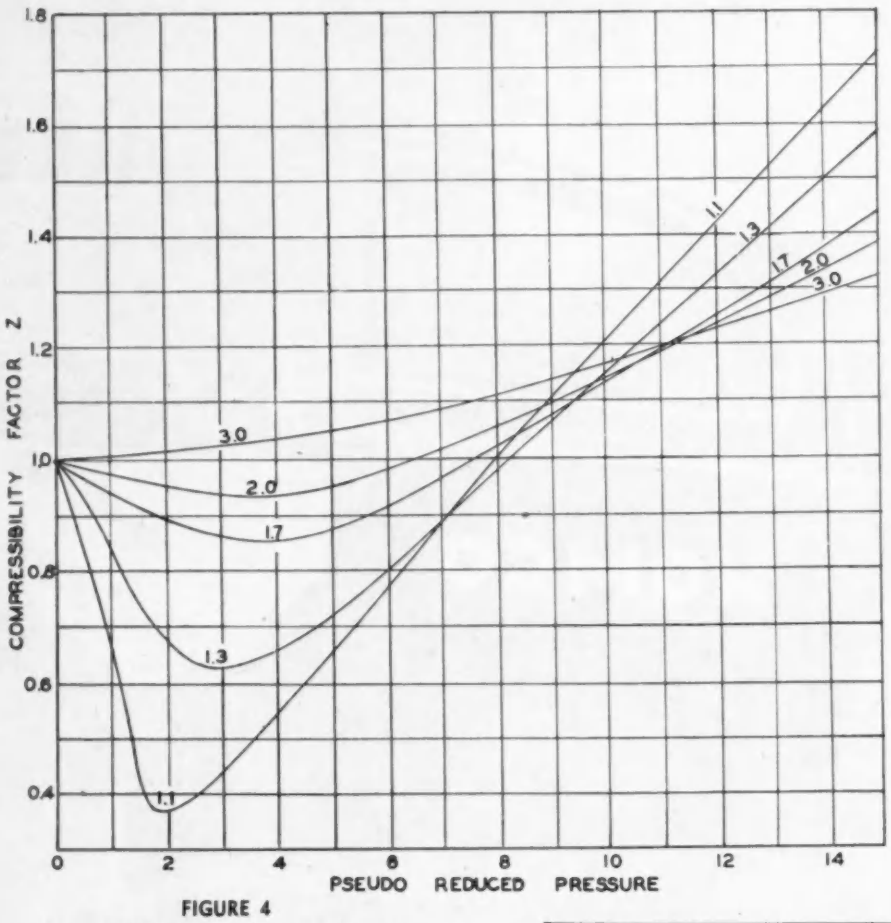


FIGURE 4
Compressibility factors for natural gases.

the condensate will be negative, or the volume of the lean gas will be greater than the volume of the rich gas. It is readily seen from Figure 4 that this condition may be, but need not be, fulfilled in the region where the compressibility factor increases with the temperature.

To show the trend in apparent volumes of the condensate with increasing pressures, a series of calculations have been made on natural gases in equilibrium with crude oil. These gases are roughly equivalent to a series of condensate reservoir fluids. The condensate removed in the calculations was 85 percent of the butanes and 100 percent of the pentanes and heavier. As shown in Figure 5, under these conditions in the 2100-pound "reservoir," the condensate had a zero apparent volume but the condensate had a negative volume for the 3200-pound reservoir and a positive apparents volume for all higher pressures.

The shape of the curve showing apparent volumes of condensates as a function of pressure depends upon the quantity of condensate under consideration. The upper limit for negative apparent volumes of 5000-6000 pounds predicted from the compressibility factor chart evidently was for small quantities of high boiling condensates since the curve of Figure 5 shows a positive apparent volume for 1.2 g.p.m. of pentane and heavier at 3600 pounds.

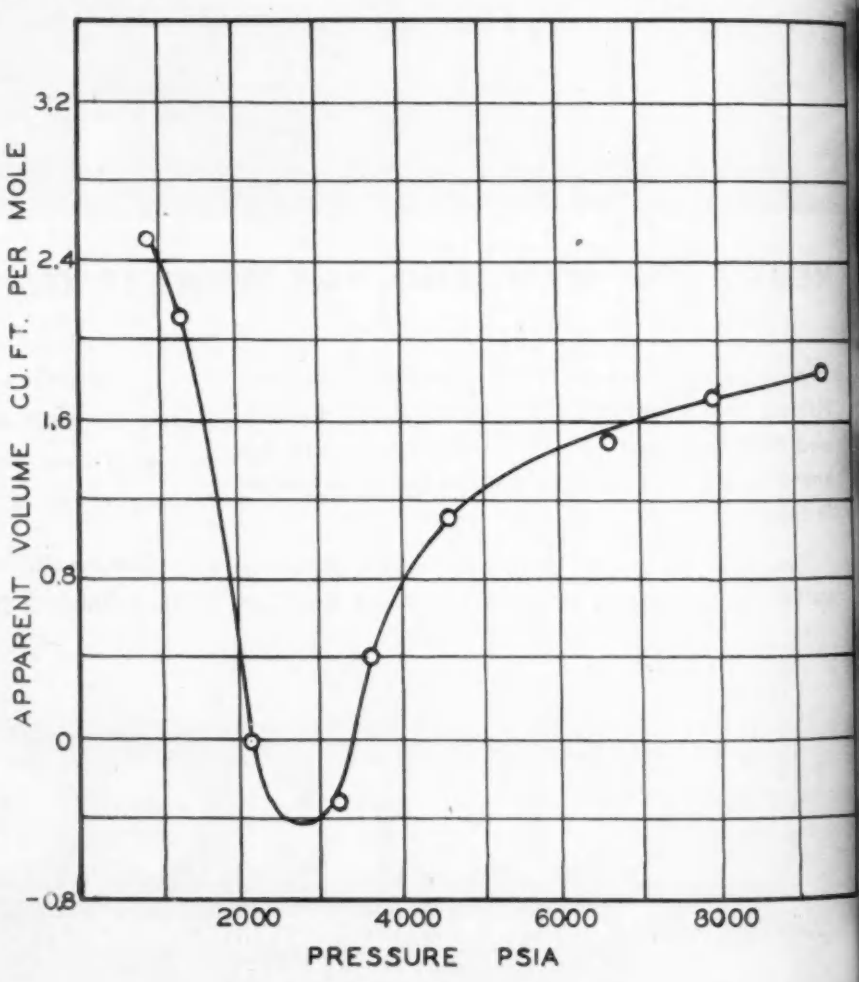
Theoretical Considerations

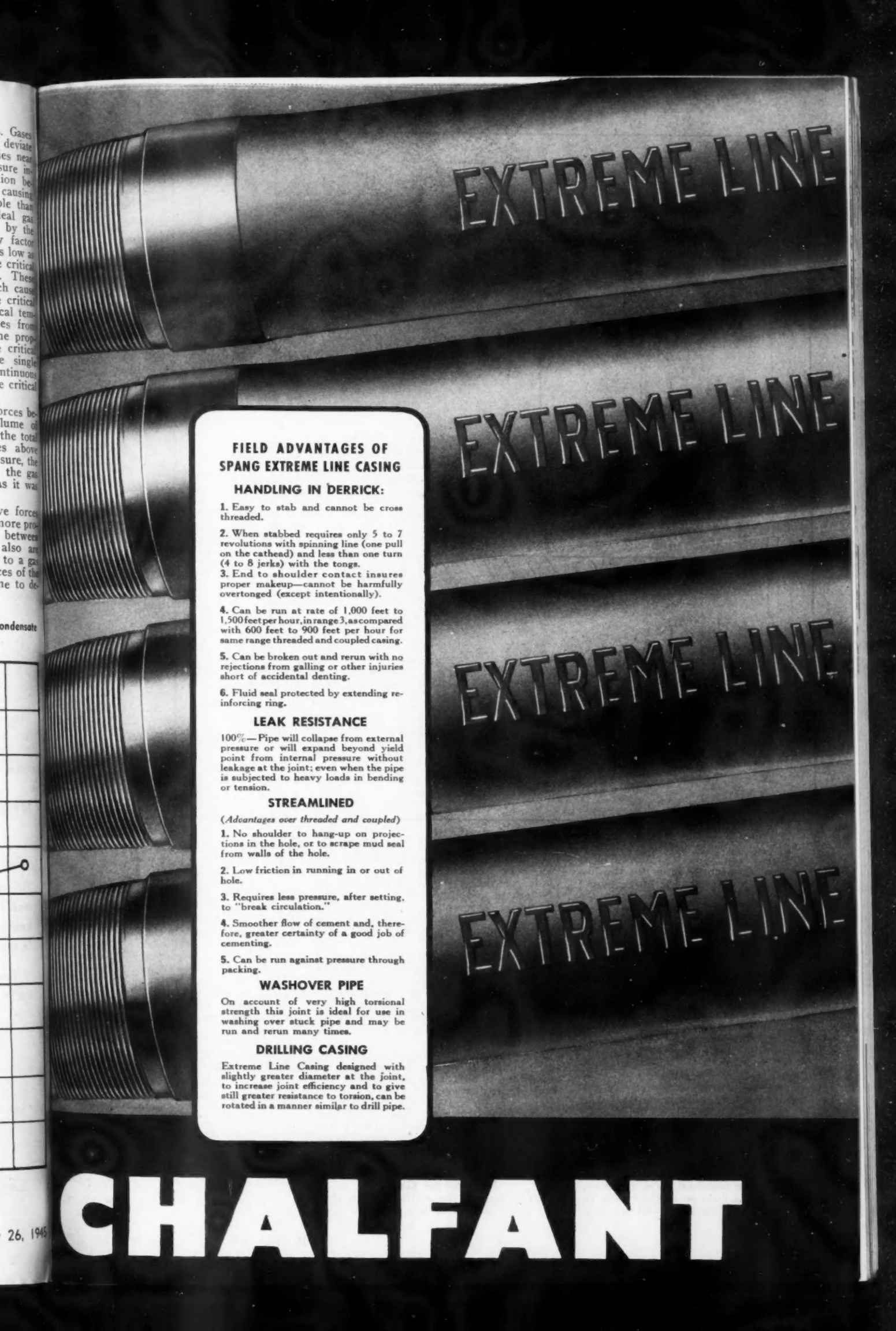
The behavior of compressible fluids was the subject of much research beginning in earnest in about 1880 by such a man as Van der Waals. Gases under pressure were found to deviate from the ideal law which applies near atmospheric pressure. As pressure increases, in general, the attraction between the molecules increases, causing the gas to be more compressible than would be predicted by the ideal gas law. This effect is represented by the decrease of the compressibility factor from unity at zero pressure to as low as 0.20 at a pressure just above the critical pressure of a pure substance. These forces are similar to those which cause liquefaction of a vapor. As the critical pressure is reached at the critical temperature, the gas phase deviates from an ideal gas and approaches the properties of the liquid. Above the critical pressure and temperature, the single phase fluid has properties continuous with the vapor and liquid at the critical point.

In addition to the cohesive forces between the molecules, the volume of molecules becomes a factor in the total volume. As the pressure rises above about 1.5 times the critical pressure, the compressibility factor rises, or the gas no longer is as compressible as it was at the lower pressure.

In the region where cohesive forces between similar molecules are more pronounced, the cohesive forces between molecules of different kinds also are large. The addition of a liquid to a gas thus increases the cohesive forces of the gas and causes the total volume to de-

FIGURE 5 (Below)
Calculated apparent volumes of condensate removed.





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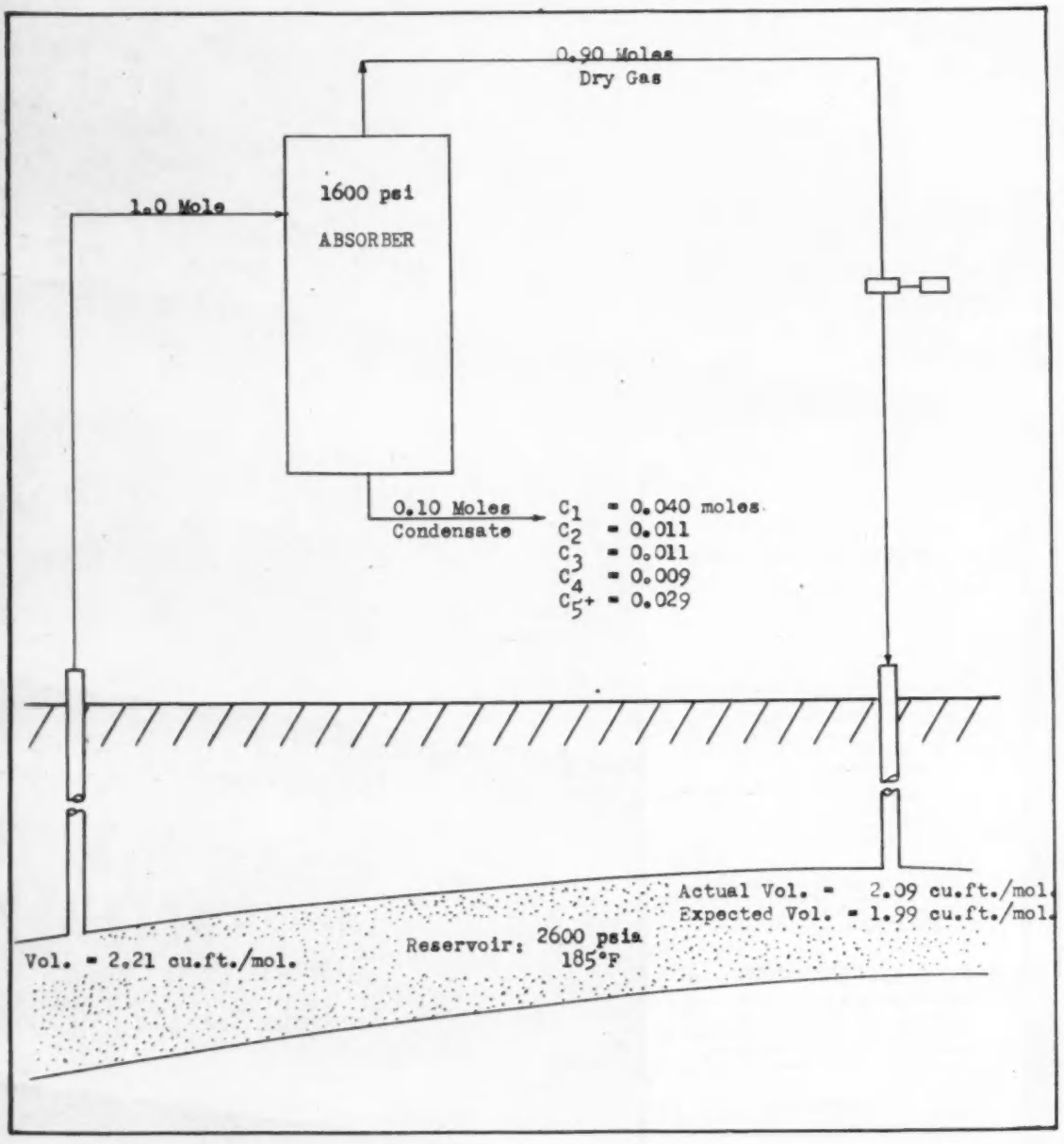

FIGURE 6
Effect of negative apparent volumes for condensates on reservoir volume of dry gas from a cycling plant.

crease at constant temperature and pressure. This phenomenon is referred to as a negative apparent volume for the liquid added. At higher pressures, where the cohesive forces between similar molecules is not as important as the volume of the molecules, the addition of a liquid to a gas causes the mixture to have a larger volume than the gas originally had under pressure. At these high pressures, the liquid appears to have a positive volume.

Condensate Bearing Gases

High pressure gases bearing condensate in the reservoir as a single phase mixture are produced to the surface of the earth, stripped of the normally liquid hydrocarbons, and the residue gas is often returned to the reservoir. Table 2 indicates that if the stripping process could be limited to the butanes and heavier, the residue gas would likely have a volume equal to or in excess of the original volumes of the wet gas at the conditions in the reservoir. If the apparent volumes of the condensate removed were negative, the residue gas volume in the reservoir at the original temperature and pressure would exceed that of the rich gas. However, actual stripping processes must be considered, which processes usually include removal of some of the methane and ethane along with the condensate. Figure 6 represents the cycling plant which employs the absorption process and removes methane and ethane as well as the normally liquid constituents from the rich gas. When 90 mol. percent of the original wet gas is returned to the reservoir, this 90 percent of the gas occupies 94.5 percent of the original volume. The removal of methane and ethane in the liquid masks the negative apparent volumes of the normally liquid constituents.

In practical operations, the methane and ethane in the absorbed liquid are required for plant fuel and hence are not available for return. However, the effect of the negative apparent volumes for the condensate still would enter into the material balance for a plant on a mol. basis when converting these quantities into reservoir volumes.

Absorption of Liquids in Reservoir By Residue Gases

The foregoing discussion has another practical aspect with regard to the volume changes which occur in the reservoir. When a dry residue gas passes through a sand, wet with hydrocarbon condensate, vaporization of the condensate would likely cause the residue gas to shrink because of an apparent negative volume of the liquid. Thus, the residue gas may shrink as it passes through the reservoir. A knowledge of the absence or presence of condensate on the sand in the reservoir would be helpful in predicting the compressibility factor for the returned gas. Material and volume balance calculations, based on negative apparent volumes for the condensate removed, may have to be compensated for similar effects in the reservoir when hydrocarbon liquids vaporize into the dry gas.

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[6] Standing and Katz, Trans AIME 146, 140 (1942).

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Training Plan Needed For Oil Field Workers

Well-directed program in answer to manpower shortage is imperative if development is to continue at normal level

By A. R. McTEE, Staff Writer

FOREMOST among the problems facing oil companies is that of keeping a staff of technicians to cope with the vicissitudes of finding and producing oil. Today the successful performance of many of the simplest operations in drilling for and producing oil depends upon a high degree of skill and training. Research has proved beyond any doubt that scientific principles govern in the exploitation of any natural resource. Oil and gas especially require exact application of many of the fundamental laws of mechanics, physics, and chemistry to find, in the first place, and to develop and utilize in the second. Increasing use of these laws is bound to be necessary as these minerals become more difficult to discover.

A great majority of the technicians from the exploration and producing branches of the industry are now in the military service. Some will return to their old jobs, of course. A percentage will not return, and of those who do, some will not go back to their former positions. The industry is faced with the inevitable fact that not before 1951 will there be available a new crop of graduate engineers, and possibly not even then. Hence some sort of a stop-gap for this particular shortage in manpower is imperative if development is to continue at anything like a normal level of efficiency.

Obviously a training program is the answer to this problem and fortunately, the set-up for such training is already in existence. With some expansion, the present plan, it is believed, can prove very beneficial to the oil industry in providing men with sufficient technical background to carry on until the time comes when there will be a supply of thoroughly trained personnel. This plan is that for vocational training in oil and gas production being carried on between the American Petroleum Institute and various State trade and industrial training departments.

How Plan Works

The rest of this discussion will deal with the plan as it is working in Texas. However, the same system can be applied in any other state.

The federal government under the George-Deen and Smith-Hughes acts of Congress, appropriates funds which are allocated to state boards for vocational education for the purpose of conducting classes which will extend the trade knowledge of people employed in industry. These funds must be matched by state and local funds. Texas appropriates some money to be used for matching purposes. The University of Texas furnishes funds which are used to match federal funds for the purpose of employing a state coordinator whose duties are to work with local training committees in the development of instructional material and organization of classes. The classes are conducted under the auspices of local public schools with three fourths of the cost of conducting the classes being paid for out of state and federal funds by the State Board for Vocational Education. A local community, out of local funds, provides the other one fourth of the cost. The work in Texas is under the direction of J. R. D. Eddy, director of industrial and business extension training, at the University of Texas, Austin.

It is the director's belief that this plan has valuable long-range potentialities for the present emergency in manpower. Here is his proposal of how the problem may be met: Through proper presentation of the plan, non-engineers now employed in the oil industry may be induced to prepare themselves to function as technicians, special technical assistants, etc., in oil and gas production work. This depends of course upon the premise that management groups see the logic in developing men of this type and cooperate in making such a program possible.

Suggested Courses

Fox example, at Odessa-Midland, let us say, men selected and sponsored by several of the oil companies could be offered an intensive trade extension course of nine or more hours per week for a year, partly on the employer's time perhaps. Management would need to be very specific in plans for the future use of such men sponsored to receive the training.

The courses would vary from place to place and from group to group. At Odessa, some of the work required would include the following:

Mathematics: Construction and use of curves; application of formulae, use of the slide rule and calculating machines; staking locations with a transit.

Science: Geology of the area; dehydration and sweetening of West Texas gas; cause of corrosion; use of chemical and weighting materials in the drilling muds; gas testing; mud testing; water treating methods.

Field Practices: Reservoir pressure and temperature survey; well logging; drilling mud control; oil well completion; potential tests; report writing; field handling of gas and oil; oil well servicing including cleanout and workover methods.

Drawing: Curves; contour maps; field sketching; well logs; surface mapping, etc.

Eddy suggests that work of the general type outlined above ought to be developed in the Odessa and Kilgore areas especially.

Aside from the immediate benefit to the men in actual work, the curriculum developed would be useful in meeting the training and re-training of demobilized service men who will be coming to the oil companies for employment in increasing numbers from now on. Battalions of men have been trained by the Army engineers along these identical lines for service in the South Pacific oil fields which will be in combat zones for considerable time after recapture from the enemy, and which will have to be rehabilitated by our forces.

Permian Basin Studied

The training program in Texas for 1945 is centered in the Permian Basin and in a continuation of that developed in 1944 at Odessa. In addition to the general subject of "Pressure Maintenance in the Permian Basin," a new problem common to the area between Midland and Monahans and Levelland, is being included. It comprises 6 units of work, as follows: theory of pressure maintenance; geology of the Permian Basin; oil and gas reservoirs; mathematics of oil production; field operating practices; and specific application to various pools.

The first four of these units have been completed in sufficient quantity for the entire Permian Basin district. The last two are being prepared in Midland and Odessa now. In Odessa, the first two, theory of pressure maintenance, and geology of the Permian Basin have been taught, and a field operating practice course is in progress. The last three units will be offered this spring in Odessa.

The first three units will later be offered in Crane, Kermit, Wickett, North Cowden, Denver City, and Sundown, with a total of 33 additional classes in these places. Next fall the work can be completed in each of these centers.

It was believed that in the Permian Basin there was an opportunity to reach the greatest number of people with material already or partly prepared.

In the Panhandle district, Pampa-Borger area, the advisory committee determined last year to maintain a permanent program, and asked for a full-time area co-ordinator. The commitee made specific requests for the study of repressuring methods by pumpers and roustabouts, and a short course in water treating.

It has been found in Texas that the need for vocational training for employes of the oil industry may be predicated on one or the other of these three situations:

Special Courses

Due to the introduction of a new problem, a new process, or new procedures in an established sector of the industry, training may be required. Eddy cities Kilgore in East Texas, and an example of this. In 1944 a "Salt Water Disposal" course was badly needed there because of the large-scale procedure of disposing of salt water by injecting it into underground porous sands. Also the plan to repressure the West Pampa pool at Pampa, by large-scale gas injection is another example, as are the many secondary recovery projects under discussion in the Permian Basin at this time. Most of the need for this

■ CONTINUED ON PAGE 64

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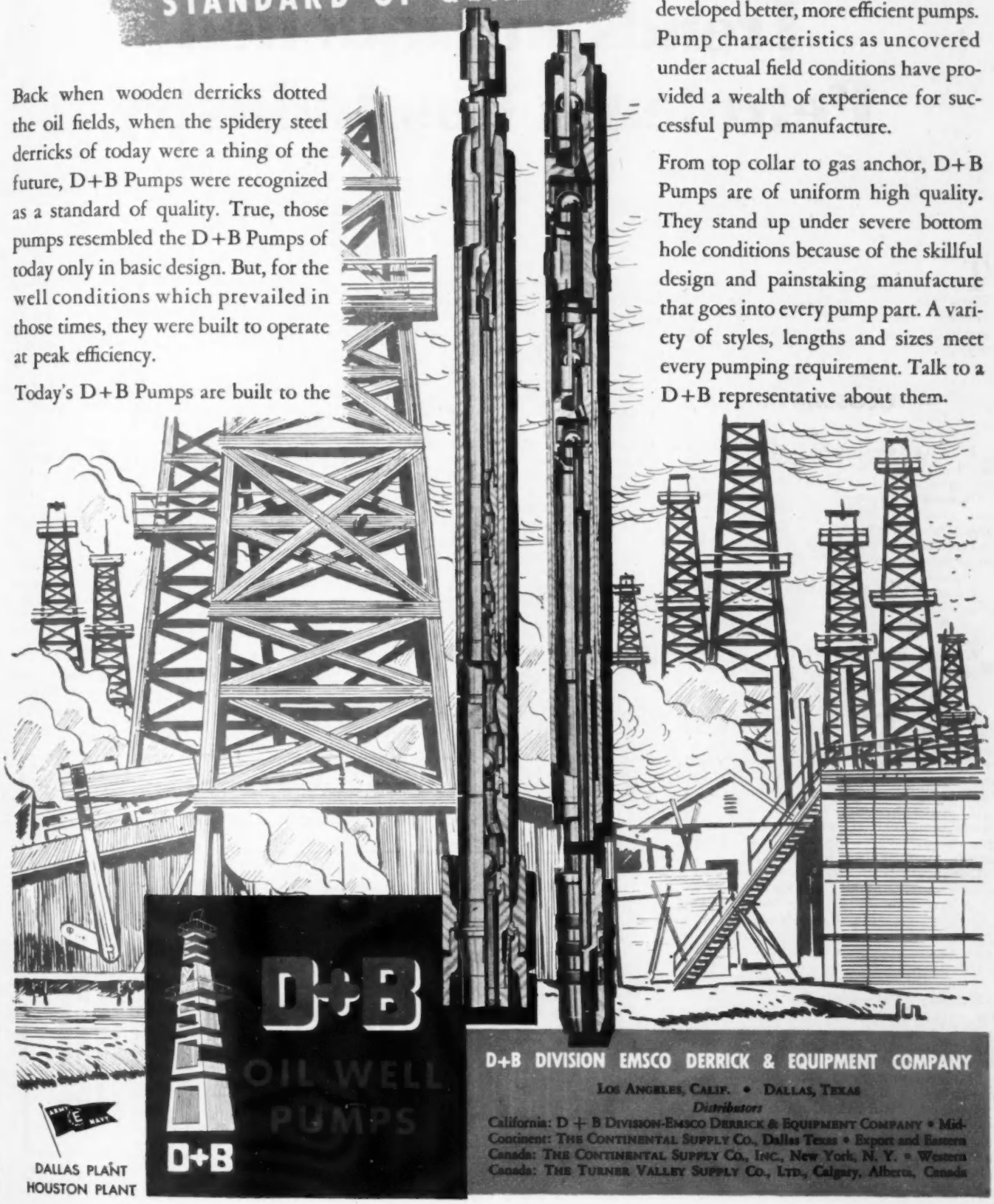

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Product moves into the critical class as developments bring about its application as raw material, this in addition to use as fuel and source of energy. An industry of ever-expanding proportions is assured, current survey by PAW indicates

Trends in Liquefied Petroleum Gas Industry

By PAUL K. THOMPSON
Chief, Liquefied Petroleum Gas Section, Natural Gas and Natural Gasoline Division, Petroleum Administration for War

THE continued use of liquified petroleum gas as a fuel and a source of energy, together with its more recent application as a raw material in the production of aviation fuel, synthetic rubber and chemicals, has placed this product foremost in the class of critical materials. Possibly the use of no other petroleum product has developed so rapidly as the separate fractions and mixtures of propane and the butanes.

The greatly accelerated war use of liquefied petroleum gas was definitely confirmed during the winter months of 1943-44 when transportation difficulties, together with localized shortages, brought about by necessary diversion of products as war materials, precipitated the worst winter in the history of liquefied petroleum gas. Early in the spring of 1944, it appeared that a similar condition would be encountered during the winter of 1944-45. Thus, to make available all possible information relating to the supply and demand of liquefied petroleum gas, the Petroleum Administration for War requested industry representatives to determine as nearly as possible these conditions in PAW Districts 1, 2, 3 and 4 for 1943, 1944 and the first six months of 1945. Similar information was already available for District 5, that area embracing California, Arizona, Nevada, Oregon and Washington.

This paper will discuss the service performed by the special liquefied petroleum gas survey joint subcommittee in preparing this report, making available for publication such portions of this study as wartime security permits in addition to commenting on related factors such as government regulations, distribution, etc., endeavoring to analyze these factors in the light of what may be expected in the immediate future, together with the developments which may result with the return to normal times.

James E. Pew, director of the Natural Gas and Natural Gasoline Division, Petroleum Administration for War, called a joint meeting of the liquefied petroleum gas subcommittees of PAW Districts 1, 2, 3 and 4, which resulted in the organization of a special liquefied petroleum gas survey joint subcommittee. This committee consists of the following industry representatives:

Organization of Special Liquefied Petroleum Gas Survey Joint Subcommittee

G. R. Benz, chairman, District 2, liquefied petroleum gas subcommittee

GLOSSARY

Propane—Liquefied petroleum-gas products containing 90 percent or more propane and/or propylene.

Normal Butane—Liquefied petroleum-gas products containing 90 percent or more normal butane.

Isobutane—Liquefied petroleum-gas products containing 90 percent or more isobutane.

Butane-Propane Mixtures—Liquefied petroleum-gas products containing more than 10 percent propane and/or propylene.

Normal Butane - Isobutane - Butylene Mixtures—Liquefied petroleum-gas products not included in the above classifications.

Fuel Purposes—Fuel purposes include the following: Continuous and standby uses for domestic, commercial, industrial, agricultural and utility applications including but not limited to the following: cooking, water heating, refrigerating, space heating, metal cutting, all kinds of industrial heating applications, gas manufacture, internal combustion engine fuel, drying, baking, etc.

Chemical Manufacture—Chemical manufacture includes products used as base materials or process feed stocks, additives, diluents, extenders, solvents for chemical manufacturer or processing (except specific uses otherwise classified below) and for burning to make carbon black.

Refinery Use—Includes all refinery use except that for isomerization feed stock. Includes liquefied petroleum-gas used for refinery fuel and blending purposes.

Isomerization Feed—Includes all isomerization feed stock uses.

Synthetic Rubber Components—Includes all products to be used for processing into or manufacture of synthetic rubber components.

Potential Excess Production—Product not going into the above uses.

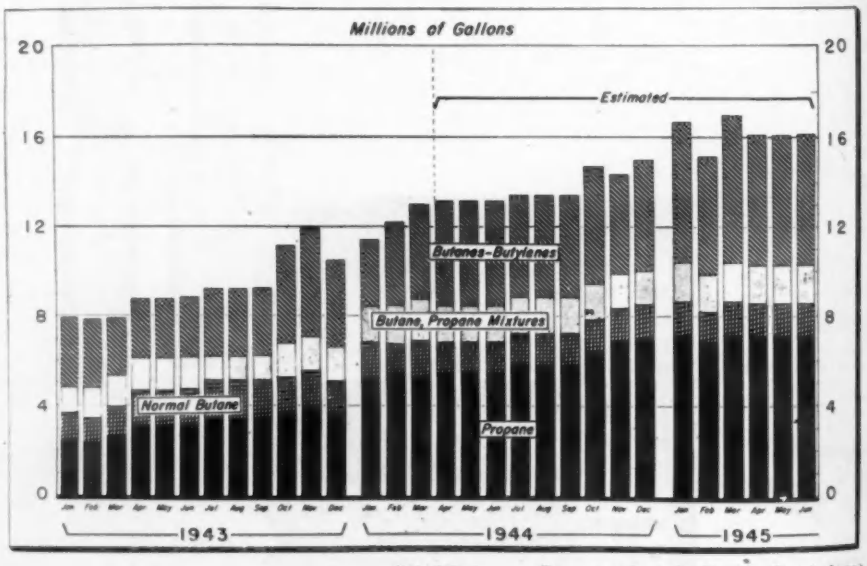

CHART 1 (Does not Include Pacific Coast Area)
Use of Liquefied Petroleum Gases for Chemical Manufacture

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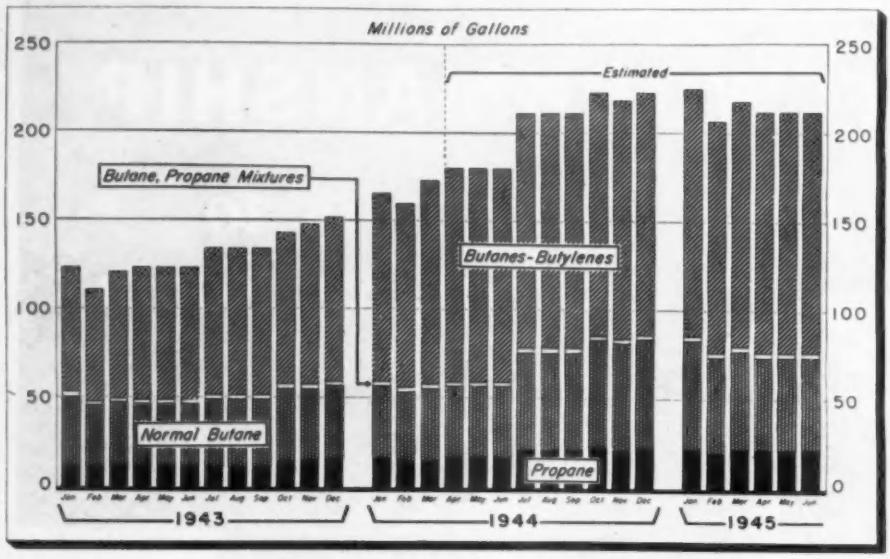

CHART 2 (Does not include Pacific Coast Area)

Refinery Uses of Liquefied Petroleum Gases

natural gas and natural gasoline committee; Louis Abramson, chairman, District 3 liquefied petroleum gas subcommittee natural gas and natural gasoline committee; R. W. Leslie, chairman, District 4 liquefied petroleum gas subcommittee natural gas and natural gasoline committee; W. A. Naumer, chairman, District 1 liquefied petroleum gas subcommittee natural gas and natural gasoline committee; and E. M. Petersen, secretary, District 2 natural gas and natural gasoline committee.

Joint Committee Formed

This committee was requested by the Petroleum Administration for War to ascertain as nearly as possible the relation between the supply and demand of liquefied petroleum gases for 1943, 1944 and the first six months of 1945 in the United States, excluding the West Coast (District 5). In carrying out this request, a questionnaire was prepared by the committee for the purpose of securing information on both the production and disposition of liquefied petroleum gases. To ascertain the actual and estimated potential production for the period in question, a form was developed which when properly filled out gave the requested information for (1) propane, (see glossary for definitions of products and other notes), (2) normal butane, (3) isobutane, (4) butane-propane mixtures, and (5) normal butane-isobutane-butylene mixtures. In determining the disposition of products, a separate form for each of the above products was developed to indicate that amount for (1) fuel purposes, (2) chemical manufacture, (3) refinery use, (4) isomerization feed, (5) synthetic rubber components, and (6) potential excess production.

189 Companies Answer

Information was received from 189 separate companies—six companies did not reply in any way to the questionnaire or the followup communications. Industry response is more completely outlined as follows:

Companies supplying information for report—110 (representing 201 plants).

Companies contacted but to whose operations the questionnaire did not apply—73.

Companies not replying to questionnaire—6.

Total companies contacted—189.

The information as supplied by the 110 companies representing 201 different plants was summarized and reported graphically by the committee. In addition, comments and recommendations are contained in the committee's report to PAW.

Winter Planned For

The release of the complete report at this time, in which statistics for the last nine months of 1944 are estimated, may appear to some as coming at too late a date to be of maximum value. However, and to the contrary, PAW was continuously advised by the committee throughout the progress of the survey, and since the major portion of the work was completed during the summer months, the resulting information has been of invaluable help in planning for the present winter. It is quite impossible to enumerate here the difficulties encountered by the committee in conducting this study, these difficulties being directly responsible for the apparent delay in its final presentation.

The liquefied petroleum-gas survey covered only the production and disposition of products. Naturally, related problems such as transportation, manpower and lack of equipment contribute to the success or failure of wartime distribution even though the required products are available in the field or refinery. It was decided to limit this study, as previously noted, and rely upon information presently available to industry concerning distribution. Shortly after this study was under way, it was evident that such a decision was correct because it was necessary for the committe to exert all its energy to conduct and complete this work even at a late date. The many problems encountered by the committee did not affect the quality of their final report. The successful manner in which these problems were solved is partly reflected in their splendid report, a portion of which is discussed herein.

In analyzing the relationship of supply and disposition of liquefied petroleum-gas, widely different local conditions become apparent. Although such conditions contribute to the over-all picture, any single condition is not necessarily representative of the entire situation as reflected by such a survey. Too, ever-changing problems of transportation and storage added to the many other variables together make the present liquefied petroleum-gas fuel situation a problem of most difficult proportions. These variables dictate that the release of information relating to the total production and use of liquefied petroleum-gas as fuel, would tend to distort the picture and result in false conclusions rather than to provide a basis for Industry to solve its present problems. Accordingly, the use of liquefied petroleum-gas as fuel is only commented on herein while its use as a chemical raw material, for refinery operations, and for synthetic rubber components is discussed graphically with actual and estimated yearly figures presented.

Trend Illustrated

The growing trend of liquefied petroleum-gas as a chemical raw material is shown in Chart 1. The major components, presently employed for chemical use, are propane and butane-butylene mixtures. This study indicates that a total of 389,127,500 gallon equivalent petroleum-gas, as a liquid, was used as a chemical raw material in 1943. The 1944 requirement is set at 159,788,000 gallons, an increase of 44 percent. It should be noted that these amounts are for that liquefied petroleum-gas shipped as a liquid only. Larger amounts of these gases are delivered to chemical plants in the gaseous form by pipelines. A recent estimate[1] of the quantity of liquefied petroleum-gas used as a chemical raw material, delivered as liquid or gas in the United States, indicates that a total of 389,127,500 gallon equivalent was used in 1943. The 1944 requirement, with the latter nine months estimated, was set at a 478,022,000 gallon equivalent, an increase of 23 percent. This chemical use of liquefied petroleum-gas continues to grow with prediction of ever increasing amounts of ethane-propane and propane-butane mixtures as raw material in processes employing regenerative cracking and catalytic oxidation, respectively.

Large Quantities Used

In the production of newer, better and greater quantities of aviation fuel and to continue to meet essential military and civilian requirements of various fuels and other petroleum products, large quantities of liquefied petroleum-gas are being used in refinery operations. In reporting the growing trend of liquefied petroleum-gas for refinery uses (Chart 2) security restrictions have necessitated that this classification include not only conventional refining demands but those for isobutane for alkylation and butane for isomerization purposes. This is necessary to eliminate any possible prediction relating to increased alkylate production. Nevertheless, the increased use of liquefied petroleum-gases for total refinery uses reflects their growing importance in the production of aviation fuel components. In 1943, 1,558,209,000 gallons of liquefied petroleum-gas were used for refinery operations and 2,327,-

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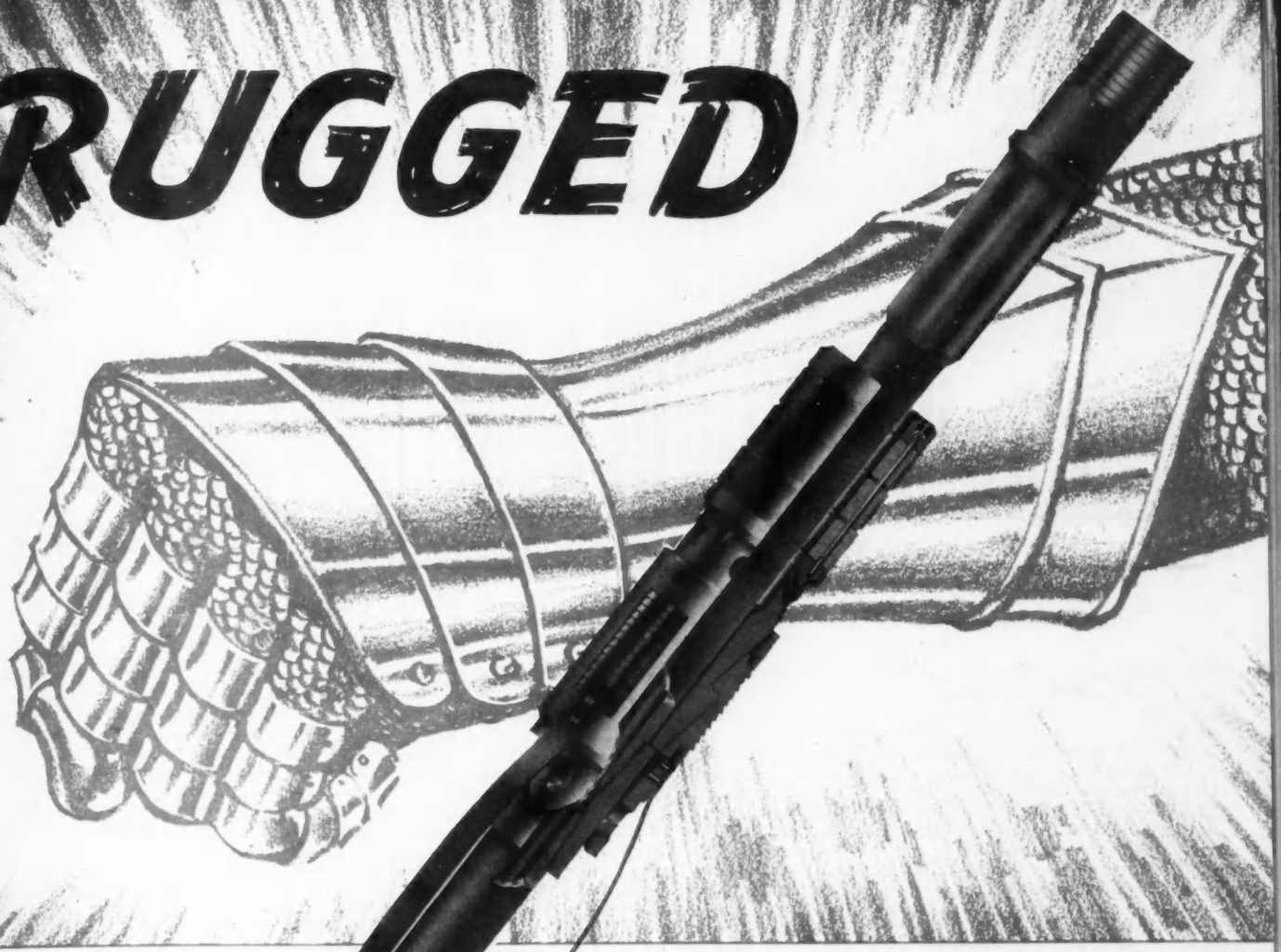

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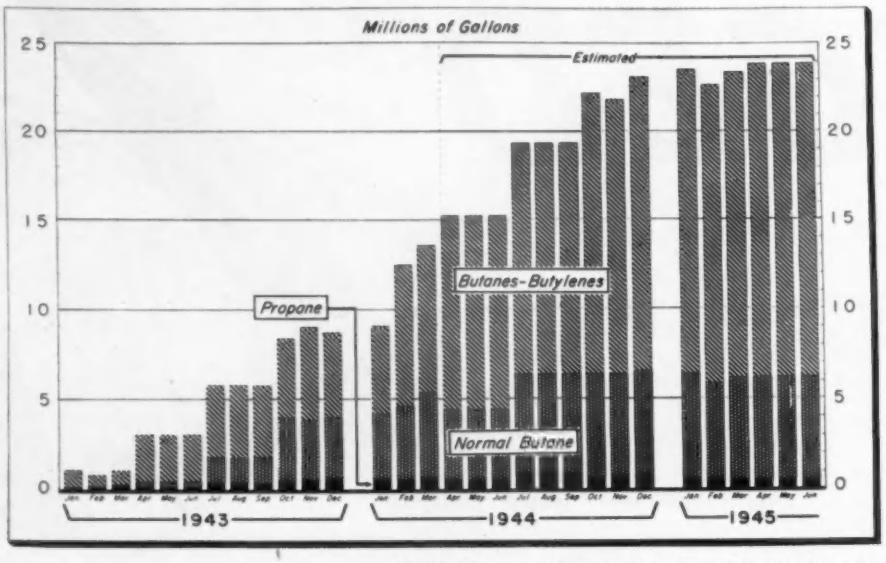

CHART 3 (Does not include Pacific Coast Area)

Use of Liquefied Petroleum Gases for Synthetic Rubber Components

208,000 gallons estimated in 1944. This increase of 768,999,000 gallons (about 50 percent) is of interest when compared with the total sales of liquefied petroleum-gases in the United States for 1943 of 675,233,000 gallons as reported by the United States Bureau of Mines[2]. This large use of liquefied petroleum-gas in refinery operations can be expected until total victory. The termination of the war in Europe should not bring any reduction in the manufacture of key aviation fuel components such as iso-octane alkylate, even though the total production of finished aviation fuel may be temporarily reduced until the concentration of the total war effort is established in the Pacific Area.

Another Burden

Another burden placed upon butanes is their wartime role in the production of synthetic rubber. In achieving the required production of synthetic rubber, which has been recognized by many as the outstanding chemical achievement of the war, enormous quantities of light hydrocarbon gases are required as raw material. The contribution of liquefied petroleum-gas products is graphically portrayed in Chart 3. In the production of butadiene, one of the chief ingredients of synthetic rubber, large quantities of butane-butene mixtures are required. Thus, as in the case of iso-octane alkylate, the production of synthetic rubber imposes large demands upon butanes. The survey reveals that 55,434,000 gallons of liquefied petroleum-gas were required for synthetic rubber production in 1943 and 205,457,000 estimated in 1944, an increase of 270 percent. Again, the future demands for liquefied petroleum-gas products for synthetic rubber components are similar to those previously mentioned in the production of aviation fuel in that no reduction in their use can be expected until total victory in Europe and the Pacific. Even with total victory, the nation's synthetic rubber plants may be expected to continue maximum production to fill backlogs of civilian requirements in addition to replacing large amounts of imported natural rubber until such time as natural rubber sources are once more revived and productive.

As mentioned above, statistical and graphical data will not be given for liquefied petroleum-gas fuel uses. However, it is interesting to note that the survey clearly indicated a swing of significant magnitude to the predominance of propane over butane-propane mixtures for fuel uses. This abnormal relationship results, of course, from the temporary diversion of large quantities of butanes to war products. The fuel use of normal butane and spent refinery butanes throughout the period studied, continues to bear the same relationship to the use of propane and butane-propane mixtures, as in the past. The use of propane as fuel appears to have experienced the greatest increase of all liquefied petroleum-gas fuels, mainly because of the diversion of butanes. Accompanying this increase are the conventional moderate seasonal fluctuations. The widespread use of butane-propane mixtures as heating fuels results in more pronounced seasonal demands than are evident in the use of any other liquefied petroleum-gas product. The moderate increase in the use of liquefied petroleum-gas products for fuel, other than butane-propane mixtures and the slight increase in the use of the latter, clearly reflect the results of the necessary steps taken by government and industry to insure the availability of these components for use in the production of vital war materials.

Ample Propane

The well-known fact that ample propane exists at production sources was indicated by the survey. As previously pointed out, the survey did not report factually on the very serious distribution phases. The lack of distribution facilities precludes the classification of this potential supply as available supply for actual consumer demands.

The critical butane and butane-propane situation of the past winter together with that of the present winter, is definitely confirmed by the survey. It should be noted that the survey indicates a greater shortage of butane and butane-propane mixtures for the winter period of 1944-45 than was experienced during the winter of 1943-44. The severity of the current shortages, as of December 1944-January 1945, of liquefied petroleum-gas for fuel is the direct result of lack of transportation facilities, mentioned above, and also of the lack of butane, which was clearly predicted by the survey as early as the summer of 1944.

Although the entire report cannot be released at this time for war security reasons, it is hoped that industry will recognize the effort of the committee and the value of the report submitted. The interest of industry in such surveys is timely, and it would seem to be appropriate for a continuation of these studies by industry on the return to normal times when war agency requests for such work will not be forthcoming. In anticipation of present liquefied petroleum-gas problems continuing throughout 1945 the Petroleum Administration for War has requested the special liquefied petroleum-gas survey joint sub-committee to continue the study for an additional period of time. It is contemplated to expand the proposed study to include PAW District 5 (West Coast), thus making the survey nationwide in scope.

Restrictive Orders

For more than three years the operations of industry have been controlled and restricted by wartime regulations. The basic restrictions affecting the liquefied petroleum-gas distribution industry are those embodied in WPB limitation order L-86 and directions thereto. Broadly, order L-86 prohibits the delivery and installation of equipment used to contain, distribute, or dispense liquefied petroleum-gases. Direction 1 to order L-86 restricts the delivery and acceptance of delivery of liquefied petroleum-gas tanks. Direction 2 to order L-86 prohibits the delivery and acceptance of delivery of liquefied petroleum-gases for use as a motor fuel in private passenger automobiles.

The original purpose of order L-86, when it was first issued April 8, 1942, was twofold: first, to conserve the then existing utilization equipment for the most important war uses; and, second, to conserve liquefied petroleum-gas itself so that war demands could be met, and also, insofar as possible, so that the requirements of existing liquefied petroleum-gas consumers could be satisfied.

Conversion Order

As the demand for liquefied petroleum-gas for use in the production of war materials increased, the primary function of order L-86 became the conservation of liquefied petroleum-gas, with the importance of equipment conservation becoming secondary but still quite necessary.

The administration of these regulations has attempted to accomplish the above purposes with a minimum of restrictions upon the industry. However, as the aviation gasoline and synthetic rubber programs progressed, with the resulting tremendous requirements for liquefied petroleum-gas products, it became necessary to impose more restrictive measures. With the tentative report of the committee available in September, 1944, it was immediately evident that additional restrictions were necessary to meet the forthcoming conditions as predicted by the Survey.

Thus, on October 24, 1944, the Petroleum Administration for War announced the issuance of PAW Directive 79. This directive prohibits the delivery or acceptance of delivery of butane for use as fuel in drilling operations where natural gas is available as a substitute

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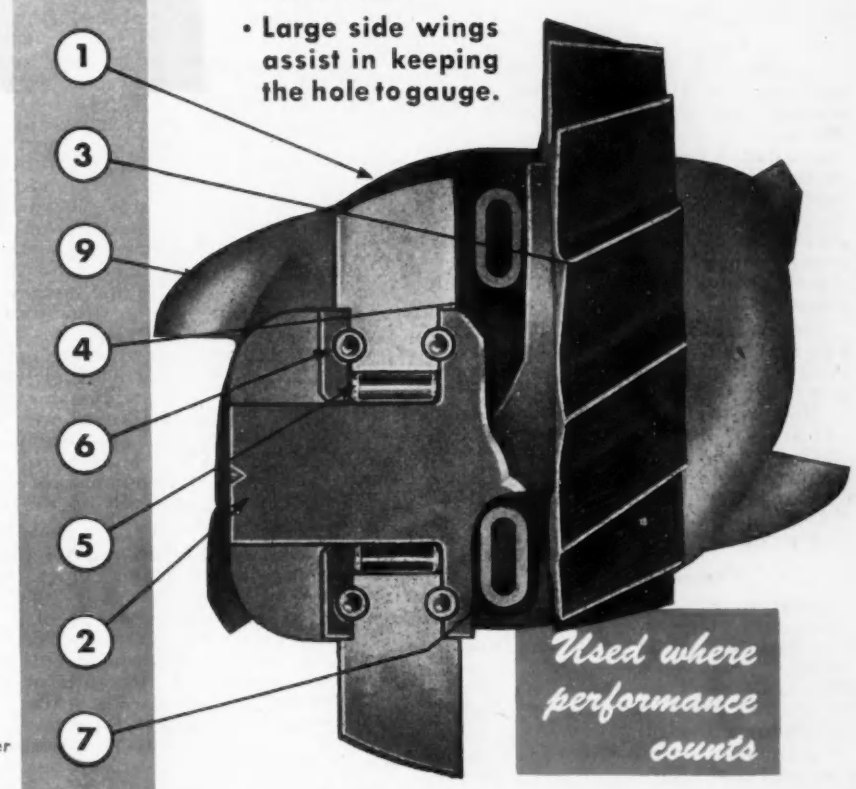

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China Discoveries Point To Important Development

Present lack of equipment hampers effort to increase flow of oil

By DON L. CARROLL, Foreign Editor

COMMERCIAL oil and gas discoveries in China during the war period, while for from sensational, are nevertheless of considerable importance to that country, and furnish definite proof that continued exploration and further development are fully justified.

Prodded by critical shortages of petroleum products and industrial fuels, the Chinese government is doing its utmost to expand production of oil and gas for war needs, but with little success to date because of lack of necessary equipment and materials. American aid is now being organized to effect a considerable expansion of operations before the end of the curernt year.

Four Fields Opened

China's first commercial discovery was made in 1937 at Wu Su, in the northern part of Sinkiang province, only 200 miles from the border of Russian Turkestan. There are 26 producing wells in the Wu Su field with an average depth of approximately 4800 feet, and the oil is reported to be of 49 to 52 gravity, with heavy gas flow. Curiously enough, the straight-run gasoline produced therefrom has an octane rating of around 80.

Far greater in immediate importance was the opening of the Yumen field in Western Kansu province, late in 1939, as a result of recommendations made by J. Marvin Weller, American geologist, who in 1937 and 1938 spent 18 months making reconnaissance studies through the interior provinces, and C. T. Sun, Chinese geologist. Up to the end of 1944 a total of 20 producing wells had been completed in this field.

Yumen Operations

Unfortunately, the Yumen field is about 1500 miles away from Chunking, the wartime capital of China. Consequently, it can be reached only by road, and only limited amounts of its oil can be utilized, until railroad or pipeline outlets are provided.

In addition to the two oil fields in Sinkiang and Kansu, two gas fields have been opened in China within the last 2 years. They are both one-well fields, in Szechwan province, and resulted from test drilling of oil seepages in anticlinal structures that are numerous in the area.

Four standard rotary rigs have been in use at the Yumen field since 1941, and up to the end of 1944 approximately 3000 acres had been proved in the field. Severe winter weather reduces the drilling season 7 months, and development progress is further slowed by shortages of all types of equipment and material. In 1943 the locality was ravaged by floods, which destroyed most of the surface installations, including a small refinery that had been put in operation there. From the wreckage of the refinery enough material was salaged to allow Chinese engineers to put two small distillation units back into operation.

Straight-Run Gasoline

The refinery is operated merely as a topping plant, producing straight-run gasoline at the rate of 8 gallons per barrel of throughput and the capacity is 20,000 gallons of gasoline per day. No provision has been made for storing or disposing of the stripped crude, so except for a small quantity of kerosine and gasoil which is produced from the side stream stripper, most of the reduced crude is run off into a nearby stream. The only available tank storage capacity is utilized for the gasoline produced. This product is hauled by truck more than 400 miles to Lanchow. By the time the trucks reach this northern metropolis no more than one half of the load remains to be delivered, since the trucks consume half of their cargoes en route. This, of course, is a wasteful way of utilizing the crude. A 1500-barrel per day thermal cracking unit was bought in 1941. Most of the equipment was shipped but was lost in Burma. However, the lost equipment has been reordered and with the opening of the Stillwell road will be hauled into China soon. A pipeline and additional equipment for the manufacture of aviation gas and lubricating oils are also under contemplation and it is highly probable that the timely development of this field will contribute greatly to the war effort in the Far East.

The Yumen oil is 38-gravity, intermediate paraffin base and comes from a Cretaceous sandstone pay that is reached at an average depth of 1350 feet, below a thick cover of Tertiary shales and sandstones whose outcrops reveal the anticlinal structure of the field. All the producing wells in the field are operated by open flow, controlled by hand valves. Their average potential is said to be 1000 barrels each per day.

In the summer of 1944, a heavy-duty steam rig was set up in the field, with a 115-foot derrick. With this equipment a deep test was started in September for stratigraphic information and to test the entire section down through the Triassic. Drilling was suspended at 2300 feet early in November and will not be resumed until weather conditions permit in the spring.

Natural gas was known in Szechwan for more than 2000 years. In the famous Tzeliuching district hundreds of wells are drilled by ancient bamboo equipment. All the gas produced there is used as fuel for the evaporation of brine which is also produced from wells drilled in the same district. The first of the two gas fields to be opened by modern equipment in Szechwan is located less than four miles from the outskirts of Chungking near the edge of the north bluff high above the Yangtze River, and southwest of the city. A faulted anticline crosses the river there and its structure is plainly discernible where the stream has cut through it. The well was drilled from the surface to the gas pay, to a depth of nearly 3300 feet, being bottomed in a limestone that is presumed to be only a little above the Permian-Triassic contact. The structure is outlined on the surface by outcropping Jurassic beds containing thin coal seams in a series of interbedded shales and sandstones. Here and there along the strike of these Jurassic beds petroleum residue occurs in the sandstone layers. The well was drilled on the basis of these surface showings.

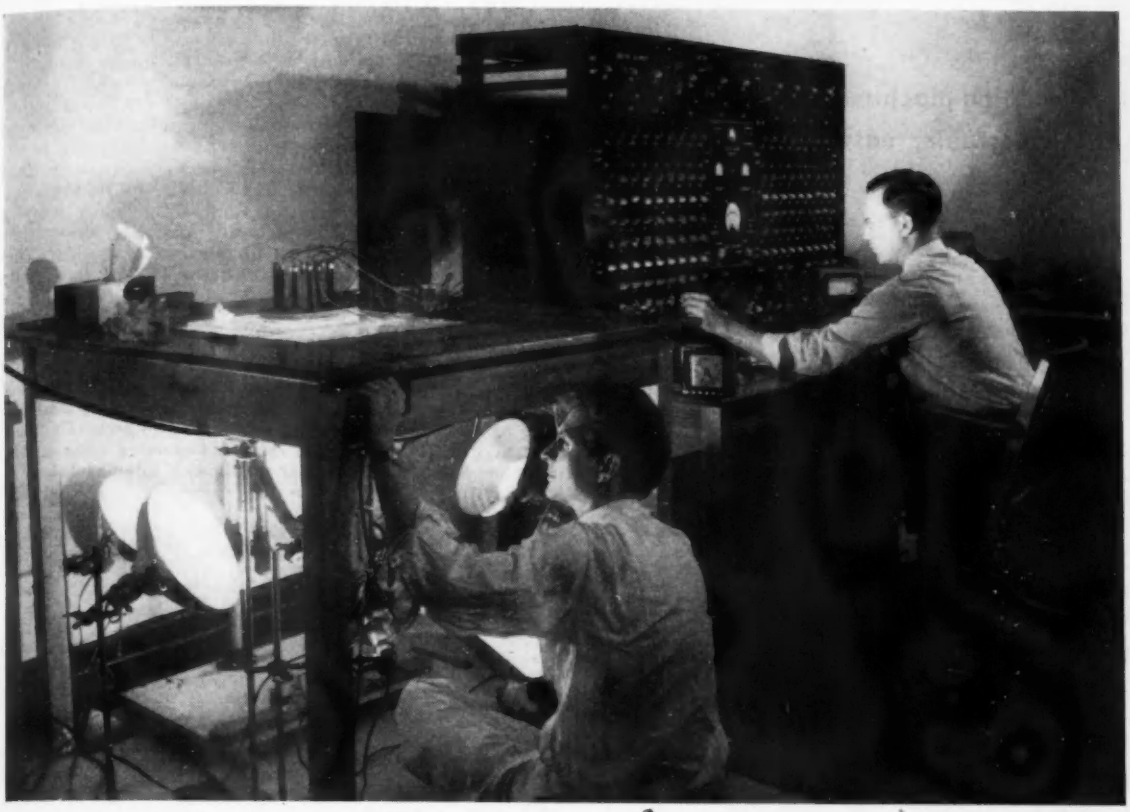
Following completion of the well late in 1943 the drilling equipment was moved 60 miles northward to a site that had been likewise selected on the basis of surface seepages in truncated anticlinal beds. Here again gas was struck in Triassic limestone, and was completed in the spring of 1944.

Gas from the first well is now being used to fuel the ferry boats across the Yangtze River in Chungking. Both of these wells are producing a relatively high pressure of 1200 pounds per square inch. The gas contains about 90 percent methane and is relatively low in sulphur. Plans to drill more gas wells immediately and to utilize the gas to produce gasoline by the American Fischer-Tropsch process is now under consideration. With the development of both the Kansu oil field and the Chungking gas field, China will be able to supply much of the gasoline needed for the B-29's and mechanized troops and motor trucks to help win the war.

Oil in Jurassic

Nearly all the seepages that have been examined in Szechwan occur in the coal-bearing Jurassic series of rocks. Since these are non-marine beds it is believed by Weller and others that small amounts of oil have migrated upward into them from more petroliferous beds below, either in the Triassic or lower. One of the most recently found seepages worth mentioning is the one near Chengtu, where a highly naphthentic oil seeps from a Jurassic coal bed at a rate of 50 gallons a day. A battered old drilling machine has been set up there and active work is under way. Generally sepaking, the future outlook of oil in China is good and it goes without saying that many locations will deserve and get considerable exploratory attention as soon as world conditions permit.

Petroleum Reservoir Services for Primary and Secondary Recovery



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A Valuable "How" Article

Shop-Made Load Lifter Arm Gives Welding Unit Speed

Efficiency of field welding machine may be measurably increased by employment of portable, easily-manipulated crane device

ANY lessening of the amount of physical labor required for pipe line or general field work is doubly repaid in time saved and in the conservation of the workmen themselves, the latter resulting in a higher efficiency in their work. The work load of the field welding unit may be measurably increased if a portable, easily-manipulated crane arm device is employed similar to the one illustrated which was devised by the production department of one major company. It consists of an extendable arm mounted on the back of the welding unit chassis and which may be lowered or raised through some 30 or more degrees to suit the need of the work. A come-along hooked to the end of the arm provides the lifting power, and this device, depending upon the manner in which it is assembled, provides a variety of possible uses in saving manpower in the field work.

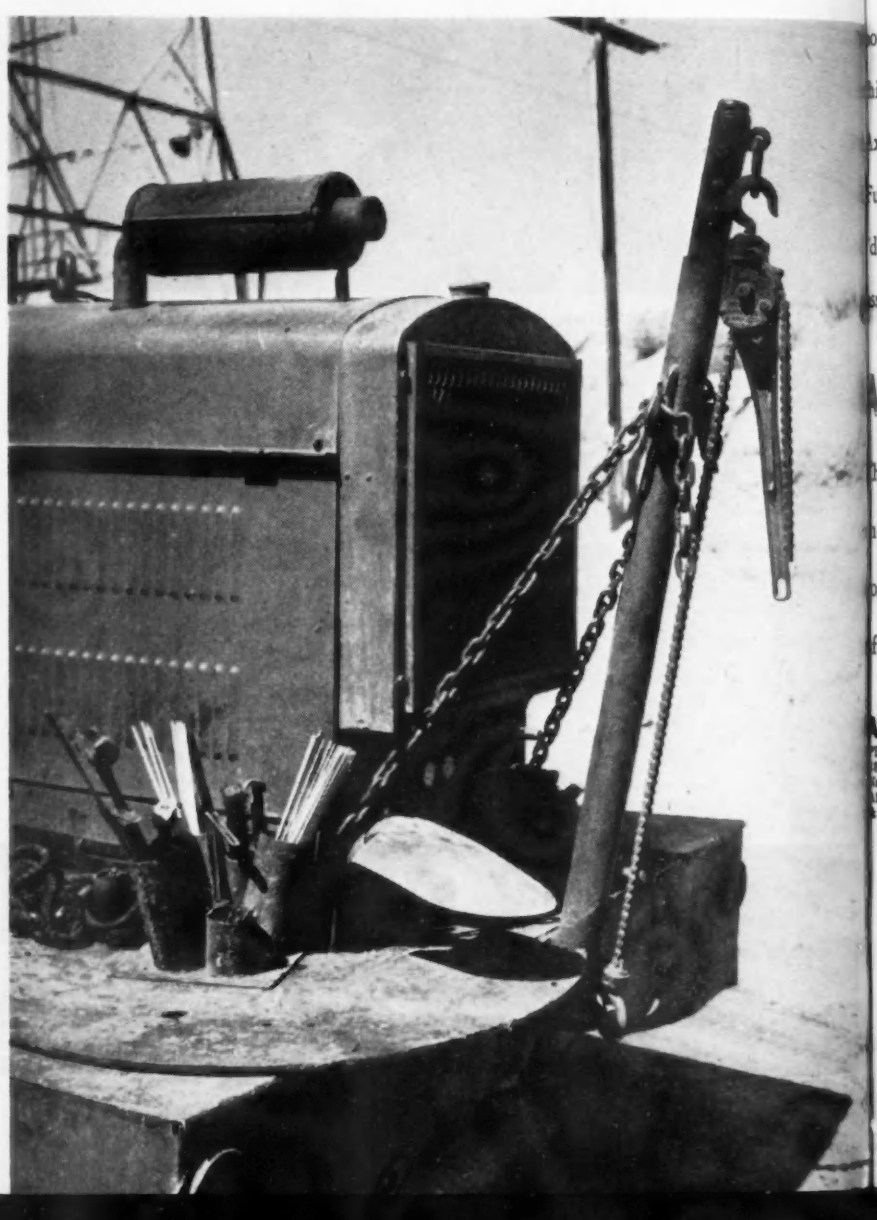
Simple But Rugged

Simple, yet rugged and dependable, the lifting arm consists of a 3-foot length of 2-inch pipe swung on a bearing surface mounted in T-fashion on the rear cross-piece of the welding unit chassis frame. An extendable length of 1½-inch pipe slipped inside the arm permits convenient handling of loads five or six feet out from the rear of the unit. Six or eight inches below the upper end of the 2-inch arm are welded two hooks removed from a chain, one being placed on either side of the arm, and with their open ends looking upward. Chain from which the hooks originally were taken is divided into two equal lengths, each 3½ to 4 feet long. The fixed ends of the chain are secured to pins in the base of the welding unit engine bed, and the other ends are looped over the hooks in supporting the long arm. One-link adjustments in the arm hooks provide a wide range of positions, lending itself to nearly any condition of terrain or type of work being handled.

Provides Ample Power

Two small steel eyes are welded to the arm; one is welded to the outer end of the 1½-inch arm, through which a ring has been placed and which supports the come-along unit within easy arm reach, while the other is welded to the rigid portion of the arm footing on the auto chassis. With the come-along in the upper position any lifting job can be performed, the latter of course depending upon the weight of the material and the angle to which the arm has been extended. With the unit hooked in the lower loop, dragging and making minor lateral adjustments of the work may be handled readily. When not in use the arm is pulled up as far as possible toward the vertical and the come-along chain is stretched between the loops and tightened to the point where it will ride safely for all between-job trips of the welding unit.

The various uses of such a lifting device are almost limitless, but foremost among them is the advantage of being able to support heavy, awkwardly-handled fittings, ends of pipe strings against possible movement, welding jigs, etc., in the proper welding position, doing away with much of the trouble that usually attends the use of blocks, crowbars and the like. The difficult job of man-handling heavy fittings or assemblies preparatory to welding is largely done away with. In short, it fills a long-felt need for a small hand-operated crane on jobs where employment of a regular crane-equipped truck in standing by the job would not be practical or economically feasible. The cost of this shop-made unit rests largely in the come-along unit itself, the arm, fittings and mount being built up in the company welding shop. The heavy work it can perform and in such short time compared to former methods, leaves no question as to the worth of the handy unit.



This extensible support with ratchet chain hoist is so rigged that it may be supported at desired angle with chains, while telescoping mast provides required vertical clearance. On many welding jobs this hand-operated crane enables the welder to dispense with the helper.

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Extending Wire Rope Life

Small amounts of lubricant should be applied often; climatic conditions determine lubrication schedule

By ELTON STERRETT, Staff Writer

STRETCH or flexure in a single wire, as in a rod, is obtained at the cost of molecular displacement, and as such cannot be compensated for by any method of lubrication. But when these same wires are combined under modern manufacturing conditions into a wire line or steel cable, such as a drilling or sand line, there has been fabricated a complicated and extremely sensitive machine, whose eventual service life is dependent largely upon two factors: Abuse and lubrication.

Since what may appear as abuse in the case of one wire rope user may be sanctioned usage in another, due to different operating conditions, it is difficult to lay down specifications for avoiding abuse of the line, as it is difficult to delimit operational handling of any other item of drilling equipment. Lubrication, on the other hand, is all too often taken for granted, assumed to be built into the line, as is the soft core in that type of cable, and any attempts at adding lubricant in the field are undertaken more with a view of limiting surface wear and abrasion of the sheaves than with the thought of providing a cushion of oil or grease between interacting faces of adjacent wires or strands.

A survey of methods followed by drilling contractors on lines in what might be classed as heavy duty service—that is, drilling below 10,000 feet with 4½-inch drill stem or below 12,000 feet with 3½-inch pipe, and with an eight- or ten-line string-up in either case—shows that the internal friction of the line is largely disregarded by many operators who are keen to limit friction in other equipment.

Internal Friction

Internal friction in wire rope is set up in two ways, and by a combination of both loadings in actual service. There is the lengthwise sliding of wires on one another, and the wrapping and sliding action of strand against strand as the straight run of line elongates under load. This motion, while of minute magnitude, applies pressure between contacting surfaces and tends to force out any lubricant present.

Then there is the displacement of wires and strands laterally as well as lengthwise as the wire line is forced from straight line service as it passes around a sheave. In the case of severe service drilling as defined already, the sheaves in crown and traveling blocks used are in diameters from 36 inches up to 48 or more. In the case of a 48-inch sheave, and with 1¼-inch 6x19 drilling line, there is a difference of 3.927 inches in the length of arc of cable lying in contact with the bottom of the sheave groove—assuming 180-degree contact—and the length of the outside of the cable. This excess of almost four inches of length in distributed over the 77 inches or so of line (75.3984 inches at the bottom of a 48-inch diameter groove) which means that each 19.7 inches of line must absorb one inch of difference in length between opposite sides, or across the diameter, of the line. If a 36-inch sheave be substituted for the 48-inch unit, then each 14.4 inches of line must absorb this one inch differential in order to accommodate the curvature of the groove. Since this accommodation cannot be accomplished by stretching the steel on one side of the neutral axis and compressing it on the other, as is partially the case with a rubber V-belt, the difference in length must be attained by the wedging of wires and strands to produce a thicker, and thus shorter line on the inside of the bend, while the strands and their component wires on the outside of the curve must pull tighter toward the axis of each individual helix and crowd closer together and diminish the overall diameter.

This displacement of wires, accomplished almost instantaneously for the entire bend when a rope is sharply deformed while at rest laterally, occurs progressively as the leading edge of a running line enters the groove of the sheave and is reversed as the line leaves the arc and again attains straight-line running. Such displacement sets up internal friction within the line, tends to crowd out the lubricant to the point where it can either be thrown off by centrifugal force as the line whirls with the sheave or drip off through force of gravity while the line is straight. Such lubricant tends through capillary action to reenter the interstices between wires when the extruding pressure is reduced, but any oil which is light enough to distribute itself in this manner is also so light that the droplets formed on the sheave will respond most readily to the centrifugal urge and fly off into space.

Methods of Lubrication

Frequent applications of relatively small amounts of lubricant prove much more effective than larger quantities, at wider intervals. Brushing on the lubricant—any of the standard wire-rope lubricants recommended by the manufacturer of the make of line being used—with a coir bristle scrubbing brush or a pair of them with a spring device for closing them around the line, insures coating of the outside of the line. If this application can be made just ahead of the bend, return or loop of the line, the interplay of the wires tends to work a certain percentage of this external lubricant within the strands, and thus to fix part of the lubricant against external abrasion and centrifugal displacement.

A device used by one drilling contractor employs a narrow strip of tough leather, supported and wrapped to form a funnel through which the line in run. At the bottom of this funnel squeeze is effected through the use of rubber contractors, so as to force the leather against the wire with pressure enough to hold back excess lubricant. A helper with a pot of warmed—not hot—lubricant, pours enough of the material into the top of the funnel to maintain a puddle of material entirely surrounding the line for some 4 to 6 inches.

This operator also reduces drum speed to one half the normal the next trip into or out of the hole after lubricating the drilling line, so as to avoid throwing off the lubricant which had collected in the space between adjacent strands during the treatment, and to give further time for capillary distribution of this supply into the line.

Another drilling company, instead of attempting to treat the line while in operation, lays down the line onto a storage reel, carrying a horizontal run out across the pipe rack to permit better inspection and lubricating of the line. Choosing a dry, nearly windless day for the job, the line is carried out to a storage reel under sufficient tension to insure good spooling. As it traverses the rack it is given a slushing with squeegee rag over a dripping trough to prevent waste, of a light oil. The lubricant selected is one which meets standard specifications for transformer oil. This oil is known to be free of all water, and thus does not abet inner corrosion. This slushing is applied at line speeds not exceeding 10 feet per

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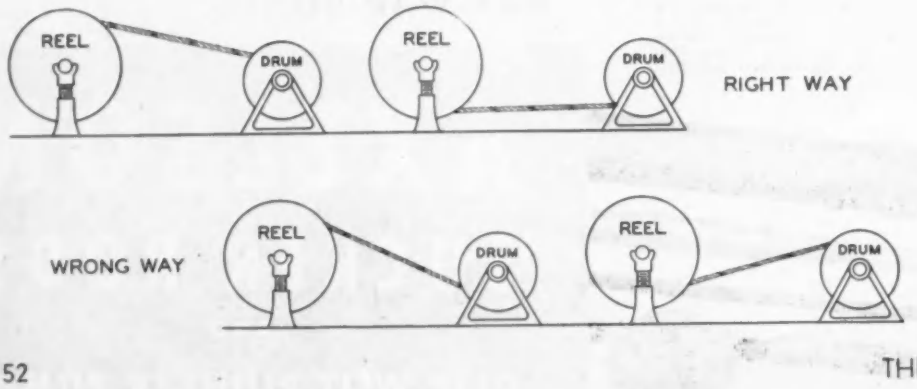

The line as delivered from the warehouse or manufacturer has proper tension and twist throughout. This uniform distribution is a most necessary part of the wire line and can be transferred with it to the drawworks and string-up if care is taken to wind and unwind in parallel. If the rope is crossed or reversed in winding, nodal tight spots and slack zones are set up, the one squeezing out lubricant, the other expanding the spaces between adjacent wires and permitting the entry of moisture and abrasive grit.

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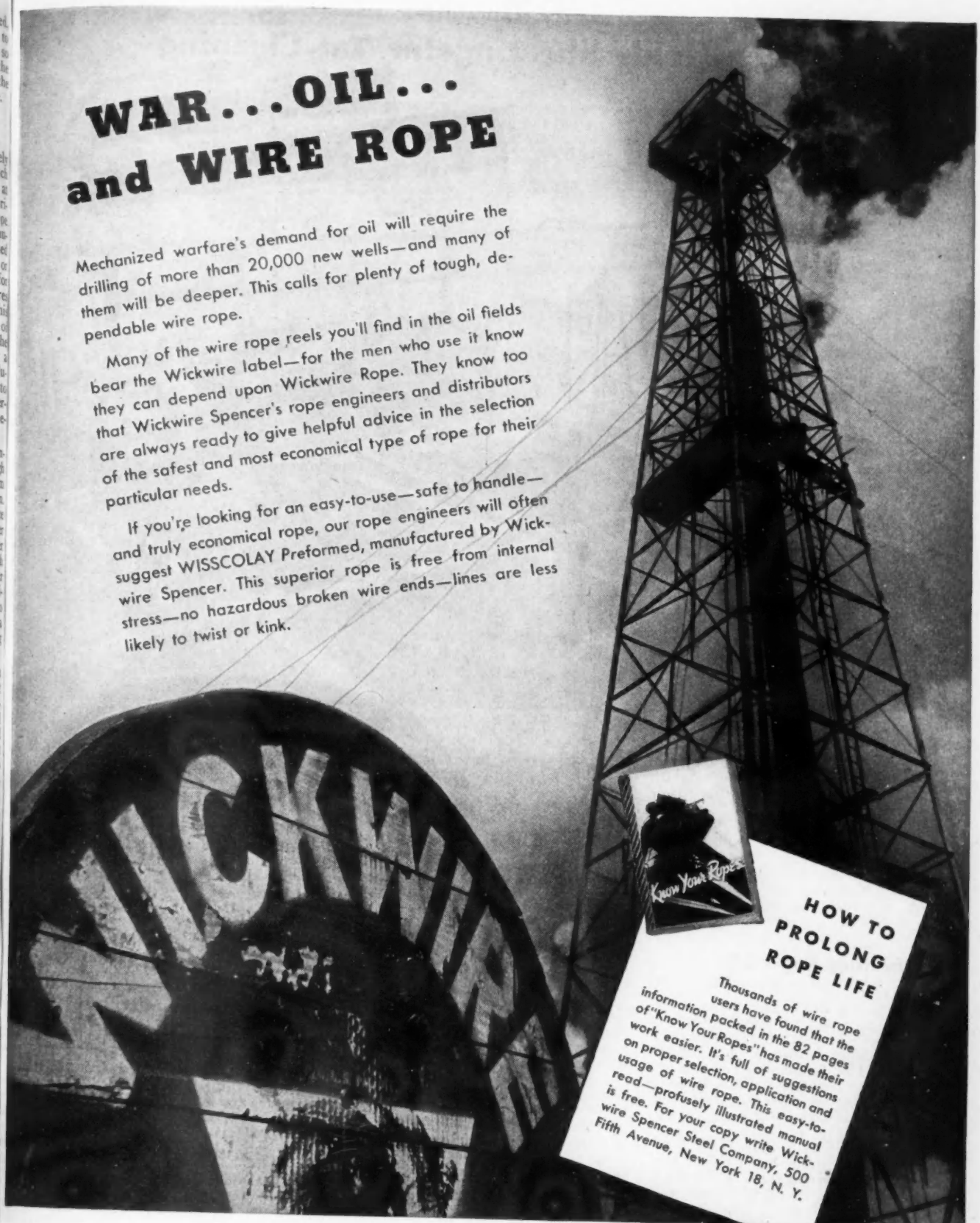

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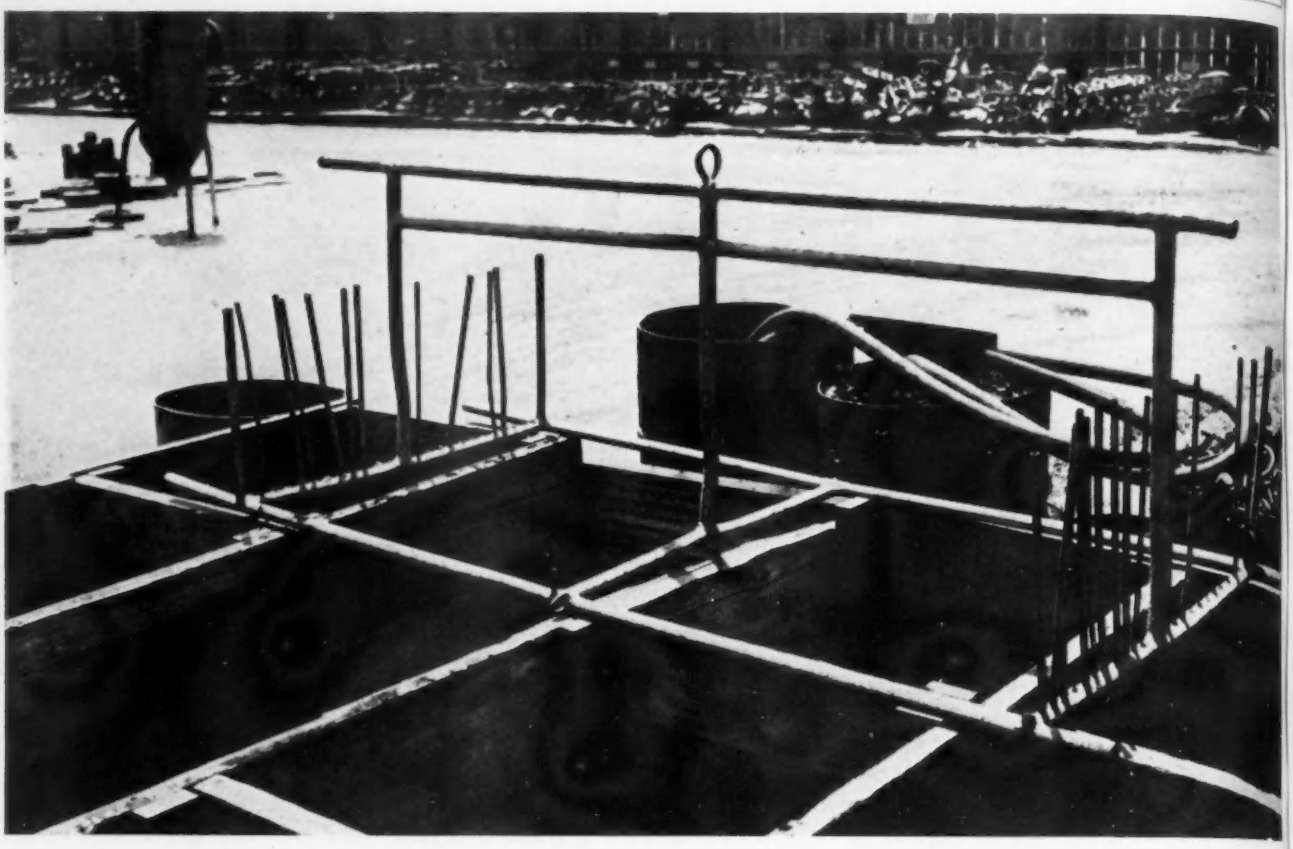

SHORT-CUT methods of facilitating the handling of salvaged materials in the maintenance yards are much sought-after by oil companies, now that that phase of the work is bearing the brunt of supplying the heavy demands of the field force.

A system of handling the very scarce item, corrugated iron, while it is being cleaned and reconditioned for further duty, consists of a light all-welded tubular rack having a row of evenly spaced upright pipes welded to each end.

While resting on the ground the rack is filled with the lengths of corrugated iron sections, the pieces being held apart or segregated by the pipe separators.

The loaded rack then is picked up with block and tackle boom and swung out over and lowered into a vat containing a hot solution, the latter effectively cleaning off paint and accumulated grime that would be difficult to remove with but a steam nozzle as is commonly done by some companies. Following the stripping and cleaning operation the rack is picked up and the materials allowed to dry.

Due to the thoroughness with which the materials are cleaned, the work of the shop crew is lessened in subsequent straightening and painting.

Lengthening Rope Life

• CONTINUED FROM PAGE 52

minute, allowing ample time for soaking the wire with oil and for visual inspection against breaks, badly abraded strands or other evidence of incipient breakdown. This inspection is *ahead of* the lubrication operation, and if fine, bright red rust is observed between wires, the line is taken from heavy-duty service and saved.

Following storing of the line, now covered with the transformer oil, on the reel, the direction of feed is reversed and the line brought back toward the derrick, for restringing. The line is first wiped with clean sacking to absorb excess transformer oil on the surface, and then is doped with a standard wire-rope lubricant.

Instead of using one snatch block, with a 90-degree turn around a short radius, the line is carried around a salvaged 36-inch sheave to prevent serious distortion, yet to afford working enough to distribute the brushed-on material, before entering the blocks for the string-up.

Examination of wire rope given this double lubrication, as compared with line merely doped on the outside, tends to show that the internal wires are neither worn unevenly nor affected by corrosion and that such treatment then makes the ultimate service life of the wire line dependent upon protection of the outside—that portion of the strands and individual wires which become worn by sheave contact or deformed by impact against external obstacles.

Wire lines operating in windy, dry areas, such as portions of West Texas, require a lubricant which will cling to the outside of the line in a continuous coating, or at least which will form a seal across the tiny valley formed by adjacent, parallel wires. This seal not only tends to restrict evaporation of the lubricant held within the core, but it also effectively bars the entry of minute sand particles between the wires as their relative positions, one to another, change as the line is deformed in passing over a crown block sheave. Excess of such a lubricant, however, forms a matrix or bed in which sand grains are carried as on sandpaper, the rubbing of such grains against wires of the line or the sides of the sheave groove tending to accelerate abrasion and cause premature failure.

For service along the Gulf Coast and in other regions of high humidity, saturation of the line at intervals with a lubricant which resists emulsifying or wetting is necessary to prevent entry of water into the core and displacement of lubricant stored there, after which a sealing coat of heavier lube is applied to protect the exterior against abrasion and the formation of saline droplets which, finding bare metal, set up rusting and rapid deterioration.

Walks which turn out drilling lines are of the proper size and capacity for making topping lifts, mooring lines and other heavy wire rope required by shipping and armed services, and while drilling is most essential, no driller can afford to overlook any artifice which will prolong the effective service life of his wire line—and proper lubrication with correct lubricants not only stretches the drilling time of the line but also protects other gear by reducing abrasion and snubbing vibration.

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Edgar Tobin Aerial Surveys has completed Ownership Maps of 168 counties in six of the South's leading oil-producing states. The area so mapped totals 140,830 square miles!

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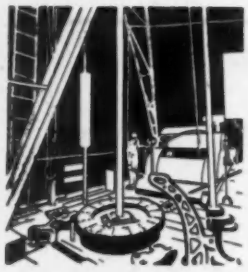
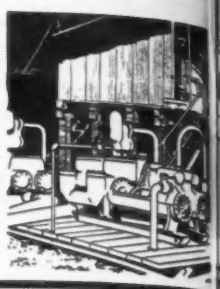


OPERATING HINTS *For Drilling Crews*



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Open Trenches Facilitate Anchorage Examinations

While drilling a wildcat well in Kansas, the operator left open the pits and trenches dug for the deadman anchorages, instead of following the usual custom and backfilling over the anchors at once.

GUY LINE ANCHORAGE

When an exceptionally hard pull was put on the casing poles, the tool dresser would stroll out of the rig to avert danger, and take a stand beside the unburied dead man which took the greatest strain. When it was discovered that the dirt, if thrown on top of the dead man did not increase its strength when a near horizontal pull was involved, this driller decided to leave the next ones uncovered unless they were in a hazardous place. When the well came in dry, it was easy to reclaim every bit of material in the "grave" and backfill the hole. Now all "graves" are left open and if necessary, a small fence is erected to exclude cattle and pedestrians. A glance from the driller as he goes on tour will tell him if the anchor is in place, which would be impossible if the hole was covered up.

T-shaped trenches leave deadman open but carry tension to base of excavations without backfill.

Portable Water Feeder Speeds Kelly Lubrication

Modern high-speed rotary tables require considerably more lubrication in the kelly bushing than the slower types in order to facilitate dropping of the kelly when making fast hole. Some drillers use a brush type feeder mounted beside the kelly which feeds oil or a pipe dope mixture on to the rotating kelly just above the bushing, while others rig up some sort of water drip or feed that will deliver a small stream to the desired point. A variation of the latter type which gives excellent service consists of a 3-legged pipe "horse" welded up from several pieces of ¾-inch pipe, the three legs being blanked off where they are welded to the horizontal part of the water conductor.

DRILL STEM WATER FEED

It is set up beside the rotary table with a water hose connected into the "tail" of the device. The long neck of the outlet is long enough to span the radius of the rotary table, the end being placed as close as possible to the kelly. Advantages of this device include permanence of set-up—not requiring close attendance of anyone to adjust position—and when not needed, it is easily carried to a far corner of the rig where it takes up little space. By locating the water hose valve beside the driller's controls, he can adjust the flow.

The unit is light, and may be equipped with feet on which sandbag ballast is laid if vibration tends to overturn the device.

Shaped like a child's toy, this rangy "horse" spans the rotary table to deliver metered stream of water against rotating kelly through arched neck. Hose supplying fluid is attached to "tail" of device.

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"REFLEX"

WATER GAGE SET

For oil field, locomotive type and marine boilers. Water shows black — steam shows white; the water level is unmistakable. U-Bolt construction is strongest and simplest to service. Glass replaced by simply removing nuts on face of gage . . . unnecessary to work between gage and boiler. Conforms with A.S.M.E., Federal and State requirements when used for pressures specified by their respective codes.

This is one of the complete line of Penberthy gages that meet every liquid level gage requirement.

PENBERTHY INJECTOR CO.

DETROIT, MICH. Canadian Plant WINDSOR, ONTARIO

OTIS PRESSURE CONTROL SERVICE - EQUIPMENT

Sub-Surface Facts

ON THE CONTROL OF FLOWING WELLS

OTIS PRESSURE CONTROL SERVICE - EQUIPMENT

. 19 1945 DALLAS, TEXAS

STOP SURFACE FREEZING WITH AN OTIS REMOVABLE BOTTOM HOLE REGULATOR

ATURAL FORMATION HEAT ABSORBS ALL LOSSES OF TEMPERATURE DUE TO GAS EXPANSION

TUBING STRING ACTS AS "MILE LONG" HEATER

The Otis Removable Bottom Hole Regtor is essentially a bottom hole choke, e capacity of which can be regulated mply by adjusting the surface choke. his makes possible variable rates of flow rough the tubing with the principal essure drop being taken across the Bottm Hole Regulator. The use of this tool ovides surface-controlled rate of proction with all the advantages of bottom le choking. The opening through the egulator automatically adjusts itself hen the size of the surface choke is anged.

The extent to which the regulator valve ens depends upon the size of the surface oke used; the larger the surface choke e greater will be the opening in the Regator, while the smaller the surface choke e smaller will be the opening through e Regulator. The operation of the Regutor is entirely automatic and variable rates of flow at substantially constant delivery pressures can be maintained by merely adjusting the surface choke. The daily delivery can be varied through a range of from zero to 9,000,000 cu. ft.; the maximum rate, however, being dependent upon the ability of the well to produce at the reduced flowing pressure.

Tubing flowing pressures are always reduced to a safe workable limit. Freezing at any rate of production is positively eliminated.

During the relatively short time since the first Bottom Hole Regulator was installed, over 1,000 successful installations have been made. A majority of these have been in the deep pressure wells in the Gulf Coast area where pressures exceed 4,000 p. s. i.; however, the tool is just as extensively used in relatively lower pressure wells where freezing conditions are encountered.

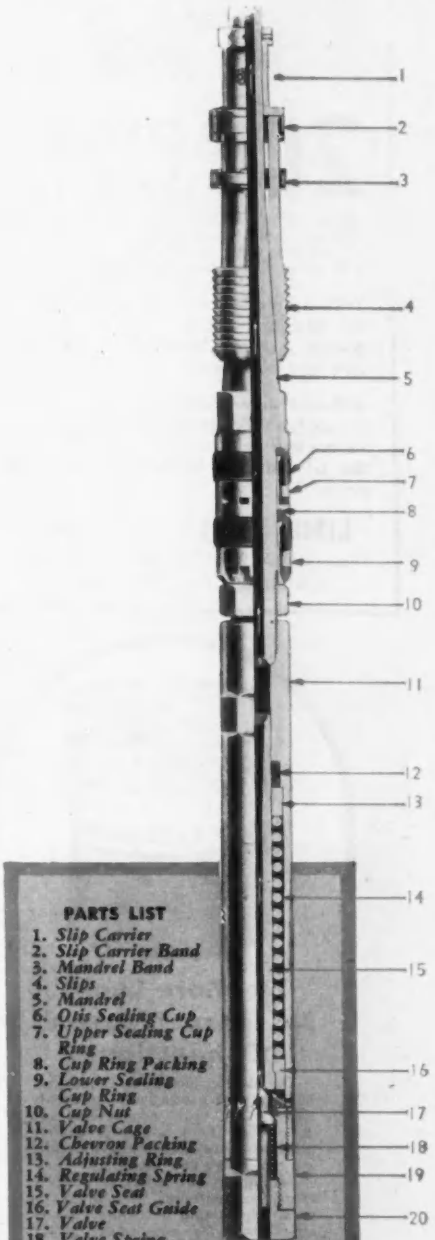
PURPOSE AND GENERAL USE

The purpose for which the Bottom Hole egulator is most generally used is to pret freezing of surface flow lines and nnections. This is accomplished by setg the Regulator at a depth where the mperature of the flow stream is sufficntly high to allow for the loss in temerature caused by the pressure drop ross the Regulator without approaching eezing temperature. The tubing string ove the Regulator acts as a "mile long eater" to reheat the gas before it reaches e surface controls. The Regulator, therre, utilizes sub-surface earth temperatures to accomplish the same purpose as the surface heaters. This method of preventing frozen flow lines is most desirable because it requires no constant supervision and eliminates the necessity of a fire as used by surface heater. Any surface flowing pressure can be reduced to a safe non-freezing level simply by the installation of one or more Regulators.

Data and formulas are now available to determine the maximum safe pressure drop that can be taken at any depth without freezing.

RUN AND PULLED ON ORDINARY STEEL MEASURING LINE

The Otis Bottom Hole Regulator is run pulled under pressure on an ordinary eel measuring line without disturbing e tubing or well pressure. Otis service crews, trained and skilled in the installation of all Otis subsurface tools, are available in most high pressure areas.



PARTS LIST

1. *Slip Carrier*
2. *Slip Carrier Band*
3. *Mandrel Band*
4. *Slips*
5. *Mandrel*
6. *Otis Sealing Cup*
7. *Upper Sealing Cup Ring*
8. *Cup Ring Packing*
9. *Lower Sealing Cup Ring*
10. *Cup Nut*
11. *Valve Cage*
12. *Chevron Packing*
13. *Adjusting Ring*
14. *Regulating Spring*
15. *Valve Seat*
16. *Valve Seat Guide*
17. *Valve*
18. *Valve Spring*
19. *Valve Housing*
20. *Valve Housing Plug*

A REQUEST

Due to the increased demand for our wire line service together with the shortage of equipment and experienced help, our service units are now operating in excess of 100 hours per week.

To give these men much needed rest, we ask that you refrain from requesting service on Sunday unless urgently needed. Our field men will greatly appreciate your cooperation in this matter.

OTIS PRESSURE CONTROL, INC.

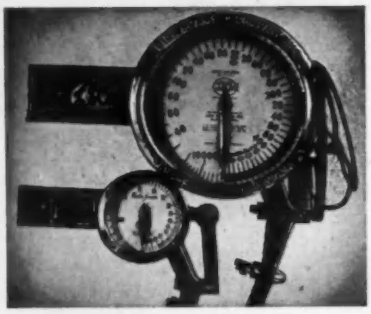
DALLAS, TEXAS

Branches: Houston, Corpus Christi and Wichita Falls, Texas; Hobbs, N. M.; New Iberia, La.; Magnolia, Ark.; Oklahoma City, Okla.

Representatives: Otis Eastern Service, Inc., Wellsville, N. Y.; Western Pressure Control, Los Angeles and Bakersfield, Calif.

Export Office: 74 Trinity Place, New York City

LINE SCALES



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(Above) Super 500,000# capacity, 14" dial. (Below) Packer Special, Capacity 40,000#, 6" dial. 18 other models for every drilling, well servicing, or work-over need.

With a Line Scale you know the pull on the line, and the weight on the bit in pounds. Accurate, sensitive, rugged, durable and economical.

Although we are working at top capacity to supply ship yards and the U. S. Navy—we are still able to furnish Line Scales to the oil industry. Write for folder and prices.

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No More Leaks
No More "Frozen" Connections

The plastic, elastic consistency of RECTORSEAL positively prevents leaks . . . seals connections indefinitely. Its lubricating quality prevents "freezing"—makes breaking out easier and faster.

You apply RECTORSEAL directly from the container with brush or swab. No mixing necessary. Use it on all threaded, coupled or gasket connections. RECTORSEAL is insoluble in all petroleum products. The perfect seal for oil, gas, steam, mud and water line connections . . . also casing and tubing collars.

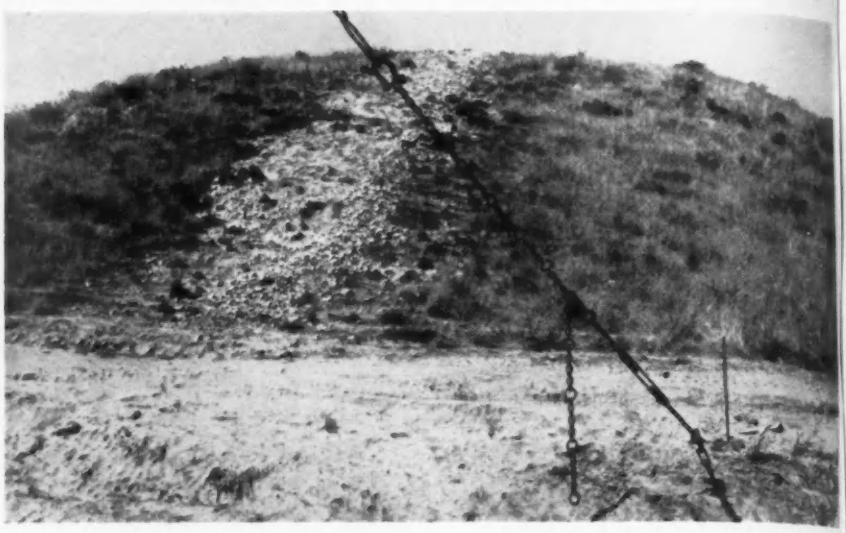
Always specify RECTORSEAL and be sure of leak prevention. Ask your supply store.

RECTOR WELL EQUIPMENT COMPANY, INC.
Fort Worth National Bank Bldg., Fort Worth, Texas
EXPORT: Lucey Export Corp., Woolworth Bldg., N. Y. C.

RECTORSEAL
THE POSITIVE LEAK PREVENTER

Segmented Chain Terminal Aids Guy Line Stringing

it may be used on many set-ups, ou wearing the cable itself, and great expediting the task of guying the rig.



Evenly spaced large links in this chain permit quick hooking of approximate length to turnbuckle, and lessen chore of taking up slack through threaded portion of unit.

DERRICK SETTING

An innovation which is saving considerable time for the rigging-up crew of one drilling company consists of a specially assembled chain tied into the guy line between the regular wire line and the turnbuckle snubbing it to the dead-man anchor. The chain consists of a series of ten short, 7-link increments of medium weight chain, each connected with a somewhat larger ring. The purpose of the larger rings is to provide loops large enough to permit attaching the line clevis or turnbuckle hook without need for making cable eyes or installing clamps.

The principal advantage of this type of hook-up lies in the speed with which the guy lines may be tied down regardless of the terrain or special conditions which may affect the location of the dead-man, and which would prevent using the same length guy line at each location. Once the chain is assembled

Unitized Pipe Foundation Carries Water Connections

WATER SUPPLY

A means of facilitating installation o the many water outlets required aroun the drilling rig is contained in the un usual but practical system used by on drilling contractor. As in the majority o portable drilling rig the various section of the base are made up of used pipe welded and assembled in such a manner that they can be made into a suitable base.

In this instance, however, the pipe sections were designed for conducting wate as well as supporting the rig. The principal base members were interconnected and provided with numerous outlets terminating in 2-inch valves at various points around the periphery of the rig base.

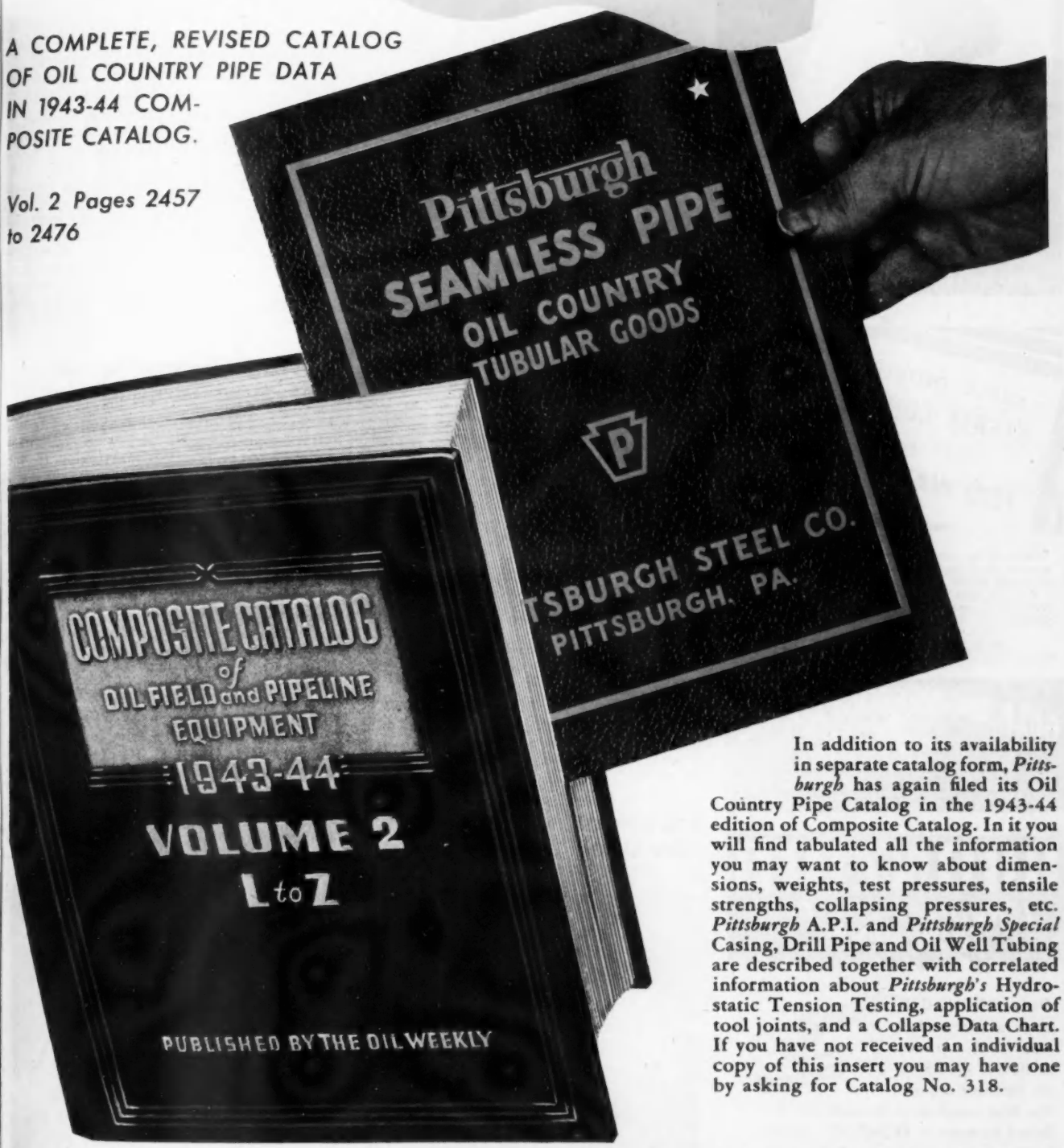
Whenever the rig is moved to a differ ent location, the problem of making

With all corners welded to withstand water pressure and provide through passageways, this sub-base serves as water distribution manifold, with outlets tapped as required.

AGAIN... for your Convenience

A COMPLETE, REVISED CATALOG OF OIL COUNTRY PIPE DATA IN 1943-44 COMPOSITE CATALOG.

Vol. 2 Pages 2457 to 2476



In addition to its availability in separate catalog form, *Pittsburgh* has again filed its Oil Country Pipe Catalog in the 1943-44 edition of Composite Catalog. In it you will find tabulated all the information you may want to know about dimensions, weights, test pressures, tensile strengths, collapsing pressures, etc. *Pittsburgh* A.P.I. and *Pittsburgh Special* Casing, Drill Pipe and Oil Well Tubing are described together with correlated information about *Pittsburgh's* Hydrostatic Tension Testing, application of tool joints, and a Collapse Data Chart. If you have not received an individual copy of this insert you may have one by asking for Catalog No. 318.

PITTSBURGH STEEL COMPANY

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DEPENDABLE
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For more detailed information see pages 2814 and 2815, Composite Catalog.

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STEAM CONDENSERS
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We deliver small condensers and feed water heaters built to your specifications in days instead of weeks or months.
Call us also for expert maintenance of your condensers and feed water heaters — QUICK SERVICE.

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GULF ENGINEERING CO., INC.
"Service Not Promises"
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LENGTHENS LIFE OF EQUIPMENT

Only BRONZOID contains pre-treated lead which arrests crystalline growth in the resultant bronze.
The high compressive strength and low Brinell hardness of BRONZOID combine the best features of bronze and babbitt metal. That's why it is called "The Ultimate in Bearing Bronze."

OIL CITY BRASS WORKS
Founders • MANUFACTURERS • *Machinists*
Beaumont, Texas, U. S. A.

hook-ups into the available domestic water lines is simplified by being able to bring the line into the handiest or nearest fitting on the rig, with no welding or thread-cutting of pipe required. By then hooking into any or all of the other fittings around the structure, the various water lines required for mud ditch, tanks, derrick floor, engines, and other points are quickly and easily taken care of.

Portable Chute Expedites Heavy Equipment Handling

Heavy steel trough, set on braced legs against overturning, directs material when skidding to rig.

EQUIPMENT HANDLING

To facilitate loading and unloading of small heavy objects, such as bits, subs and heavy fittings, one company utilizes a short steel trough which will reach from the raised derrick floor level down to the platform at truck bed level. Set upon its own three pipe legs, the trough is made of a cut-away section of boiler or separator shell, or an expanded section of "big inch" casing.

Objects being removed from the rig floor may be tossed into this skid chute and can be rolled over onto the lower platform or truck bed in a matter of seconds. In taking them up to the higher level, a light line is looped around them and they are then easily skidded up.

The unit is narrow and compactly built so it can be easily shifted to any convenient point along the edge of the derrick floor. Because of its self-contained base—a feature not usually built into the common skid—the unit may be adapted to any set of conditions, a simple staging at its lower end being the only other accessory needed.

Where the chute is used with a single type of derrick, welding a lug or ear to the bottom of the arc so as to interlock with the derrick foundation angle provides a positive hold against lateral displacement when heavy drag is placed on the device. The lug type of lock need merely be lifted free and does not tend to jam or foul as does a bolted hitch.

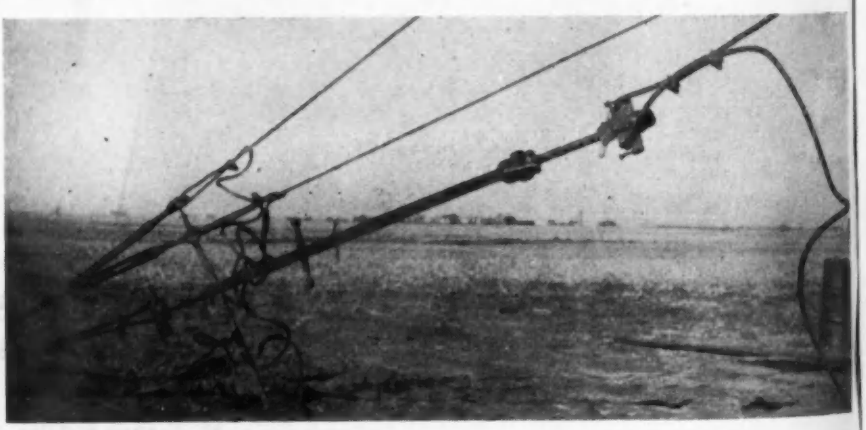
Salvage Temper Screw Serves as Turnbuckle

Shortages of material have led to the adaptation of many pieces of equipment to new uses, and in particular to the finding of places where worn out units can continue to function in other and perhaps lighter work.

CABLE TOOL RIGGING-UP

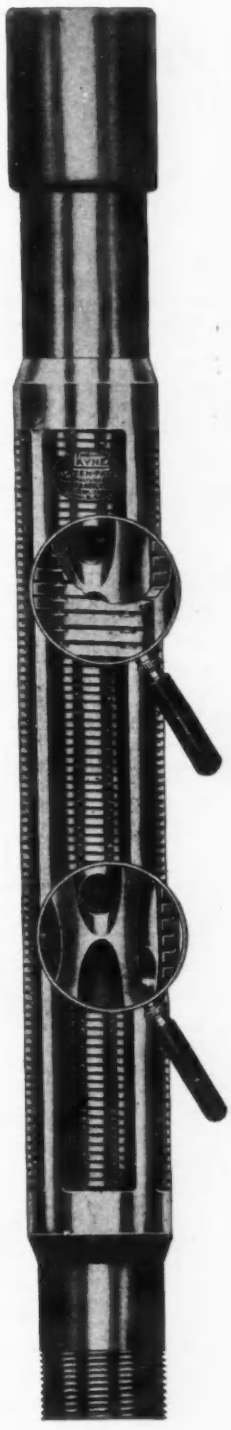
On cable tool rigs which use a mast and shear poles to handle the casing, it is necessary to have good alignment of the shear poles when pulling long strings of pipe. One drilling contractor in Kansas uses a discarded temper screw on the guy wire which takes the greatest strain. This is the guy which is in back of the mast when facing the mast from the well hole.

Another advantage of using this type of turnbuckle is that it is heavy enough that no additional weight is necessary when the other guy lines are loosened to let the shear poles swing out of the way when drilling is resumed. By adjusting this weighted turnbuckle, the blocks swing in or out of position when the other guy wires are tightened or loosened, and once set this guy wire needs no further adjusting.



When exact alignment of shear legs is desired on cable-tool rig, as when pulling long strings of pipe, one contractor uses salvaged temper screw to take up guy-line slack.

Precision Made



Means PERFECT PERFORMANCE

Yes—the Layne screen is "precision made." Before the wire is placed on the pipe it passes thru accurate sizing millers to guarantee uniformity. Then after being lugged it again passes thru micrometer controlled sizing rollers.

The wire is flat bottomed semi "V" shaped, that when wrapped on the pipe produces an inverted opening of the same shape that flares toward the perforations in the pipe. This allows a free passage of the fluid after it leaves the screening point of the wires.

Layne wire wrapped screens can be made on any size or length of pipe—with plain drilled holes, milled groove openings or vertical slotted openings.

THE LAYNE

WIRE WRAPPED SCREEN

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U. S. Oil Flow to Europe Will Virtually Cease After War, Publication Predicts

The United States will virtually cease to supply Europe with oil after the war, says *Ethyl News,* publication of Ethyl Corporation, in a survey of European postwar petroleum problems. War-born producing and refining facilities in the Middle East and in South America probably will absorb a substantial part of these peacetime markets, it is declared.

"Conservation of proved oil reserves in the United States, it is believed, will be the order of the day in the postwar period," the publication points out. "There will be no exportable oil, except specialty products, and the country must be prepared to fuel another war if that ever becomes necessary.

Business Loss

"This condition, translated into pre-Pearl Harbor days, means that the United States stands to lose an export business in oil products approximating $400,000,000 annually, or a volume of more than 200,000, barrels, excluding such by-products as grease, wax, petroleum coke, blending agents and asphalt.

"At best, the United States will supply only such products as aviation gasoline, of which it is the largest producer in the world, and possibly special lubricants. In pre-war years American oil shipments to Great Britain and Europe approximatel slightly more than 80,000,000 barrels, or about 40 percent of America's total export business in this commodity. These exports accounted for about 30 percent of the consumption on the continent and in Great Britain."

Extraordinary demand on the American oil industry to fuel the war has made impossible to add to underground reserves in spite of record exploratory drilling in recent years, according to *Ethyl News.*

"When the war ends, it is expected that domestic crude oil production will be cut back substantially as a conservation measure. This reduction may amount to as much as 1,000,000 barrels a day from present levels, according to industry economists. Domestic oil demand, on the other hand, is expected to exceed the amount of crude being produced.

"In consequence, the United States will have to rely on imported oil to meet its total demand, as time goes on. According to industry economists, these imports will range from 150,000 barrels a day upward; their calculations, moreover, make no provisions for any exports in the postwar period."

Europe's Needs

Just how much oil Europe will require in the postwar years is a topic of speculation among oil economists, the survey continues. "All are in fair agreement that in the immediate years of reconstruction she will not need as much oil as before the war. Meanwhile, her stocks have been severely depleted—are practically nil—because of the war and the inability to bring in new supplies. Europe's postwar demand will depend largely on the condition of her properties and the amount of destruction wrought by the war."

In 1939, consumption of oil products in Europe, including Great Britain but excluding Soviet Russia, amounted to 287,200,000 barrels. Production of crude in the European area in 1939 amounted to only 57,700,000 barrels (excluding Soviet Russia)—only a small part of consumption. Russia's production in that year amounted to 212,500,000 barrels.

"For the immediate period it is likely that the UNRRA will handle oil supplied in reoccupied nations. A sizeable quantity of needed supplies is moving from the United States for this purpose. These supplies are being utilized, however, for only vitally necessary activities, such as in the restoration of communications, utilities, transportation, agriculture and industry.

"When the European war comes to an end, and reconstruction is well under way, the demand for oil products is expected to rise as Europe's rehabilitation gathers momentum. It will be several years, however, before European needs will match those in the pre-war years."

Stripper Well Statement Form

OPA FORM (1-45) 652-2170 — FORM APPROVED BUDGET BUREAU NO. 08-R1206

This Form May Be Reproduced Without Change

UNITED STATES OF AMERICA
OFFICE OF PRICE ADMINISTRATION

STRIPPER WELL PREMIUM PLAN

NEW WELL STATEMENT

NAME OF PRODUCER

NAME OF COMPANY

ADDRESS

COUNTY AND STATE

Submit this form in duplicate to the Office of Price Administration, Petroleum Branch, Washington 25, D. C., for each new well completed or old well deepened and completed to a new horizon or sand on the following lease after January 1, 1944.

NAME OF LEASE — LOCATION OF LEASE

NAME OF POOL — COUNTY AND STATE

The undersigned operates wells producing from the above lease and hereby certifies that the Well No. _____ at location _____ on above lease, completed _____ 19___ produces from the _____ horizon or sand at a depth of: Top Pay _____ feet; Bottom _____ feet.

Total number of new producing wells completed subsequent to Jan. 1, 1944 on this lease or property unit _____ WELLS

Estimated production from this well since date of completion _____ BBLS.

Well No. _____ described above produces from a horizon or sand in the-

NAME OF POOL — COUNTY AND STATE

that was producing prior to Jan. 1, 1944 in this pool, or from a horizon or sand from which production began subsequent to Jan. 1, 1944 which horizon or sand is qualified for premium price increases under the Stripper Well Premium Plan.

SIGN HERE _____ DATE _____
(PRODUCER)

If the new well is completed outside of the geographical limits of this pool, as defined by the official nomenclature committee of the state, or by the state oil regulatory agency, a certification by the proper state oil regulatory agency should be shown below:

I, _____, duly authorized official of the _____ hereby certify that, according to the records of this Commission, The Well No. _____ described above is considered an extension of the _____ Pool, in _____
(STATE OIL REGULATORY AGENCY) (COUNTY AND STATE)

SIGN HERE _____ DATE _____

NAME OF PURCHASER

ADDRESS

PURCHASER'S CODE NO. OF LEASE OR PROPERTY UNIT — SERIAL NO.

DO NOT WRITE IN THIS SPACE

Payment approved by OPA

SIGNED _____

PRICE EXECUTIVE
PETROLEUM BRANCH

5-17861-1P

Above is a reduced facsimile of the new well statement required by OPA in carrying out its stripper-well premium plan. Such a form must be filed in duplicate for each new well completed or old well deepened or completed to a new horizon or sand after January 1, 1944.

Standard of Indiana to Award 608 Service Pins

Six hundred and eight employes will be honored by Standard Oil Company (Indiana) with the presentation of gold pins for 10 to 40 years of service each during the first six months of 1945.

The 40-year employes who will be honored include William H. Tell, assistant to the general manager of sales, while 30-year employes will include Dr. M. G. Paulus, vice president in charge of manufacturing.

Liquefied Gas

■ CONTINUED FROM PAGE 46

fuel. This directive is effective during the present heating season, November 1, 1944, to April 1, 1945. During this time the quantity of butane that will be available for drilling operations will be limited because of the demand for this fuel by domestic consumers during the winter months.

Further, the Petroleum Administration for War announced, by press release November 24, 1944, that as of that date PAW would be compelled to disapprove all applications to install equipment utilizing butane or butane-propane mixtures.

As indicated by the preliminary report of the committee and substantiated by their final report, there was a shortage amounting to 4 to 7 million gallons per month of butane for all uses. This shortage was immediately felt by the liquefied petroleum-gas industry. With the cooperation of the refining division of PAW, the necessary steps to alleviate this condition were taken to divert certain streams of mixed butanes from refinery use to liquefied petroleum-gas fuel markets.

Present Shortage

The present shortage of liquefied petroleum-gas products, the result of wartime demands, is a widely discussed subject. These discussions are not, in general, restricted to present conditions but in many cases predictions have been voiced that these shortages will continue even after the return to normal times. Some visualize a propane shortage; others predict continued difficulty in obtaining the desired amounts of butane. The discussion herein relating to liquefied petroleum-gas operations, on the return to normal times, is based upon an analysis of the survey committee's report, viewed in light of related information gathered in this division. The trend observed suggested that with the return to normal times, there will be a marked decrease in the demand for liquefied petroleum-gas products which are now required for wartime fuels and raw materials. Accompanying that decrease will be an increase in use as conventional liquefied petroleum-gas fuel, including the possible development and production of new fuels and for chemical manufacture.

Thus, an ever expanding liquefied petroleum-gas industy appears to be assured. There should be ample supplies of propane and butanes to be used as economic conditions dictate, with increased supplies as needed, made possible by the availability of equipment for their production, transportation, storage and utilization. As increased demands for liquefied petroleum-gas products come about, production should keep pace with or possibly exceed market demands. Increased discoveries of natural gas and gas-condensate fields and the development of cat-cracking operations, together with modern extraction and separation procedures, apparently assure the availability of increasing amounts of light hydrocarbon fractions for liquefied petroleum-gas products. In addition, these developments suggest production of sizeable amounts of liquefied petroleum-gas in locations where hertofore a long haul by tank car was necessary.

Diversified opinions have been voiced regarding the magnitude of demands which may be made of liquefied petro-

A combination that adds up to dependable oil-field power . . . and you get it only from

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Le Roi oil-field engines are built by a manufacturer specializing in the heavy-duty industrial field.

They are designed for the specific power requirements in each of the three main branches in the oil industry; drilling, oil-well pumping, and pipeline service.

They are sold and serviced by a network of specialized distributors serving the oil industry exclusively.

The performance record of Le Roi Engines is your assurance of creditable results . . .

In the tough grind of continuous oil field service, Le Roi engines stand up dependably because they have the weight and stamina "built-in" by a manufacturer who specializes in heavy-duty engines. Experienced users tell you that it pays in service, satisfaction, and trouble-free performance to have your equipment powered with Le Roi engines. Sizes range from 4 to 400 H.P. — utilizing gasoline, natural gas, or butane. Contact your nearby Le Roi distributor for full information.

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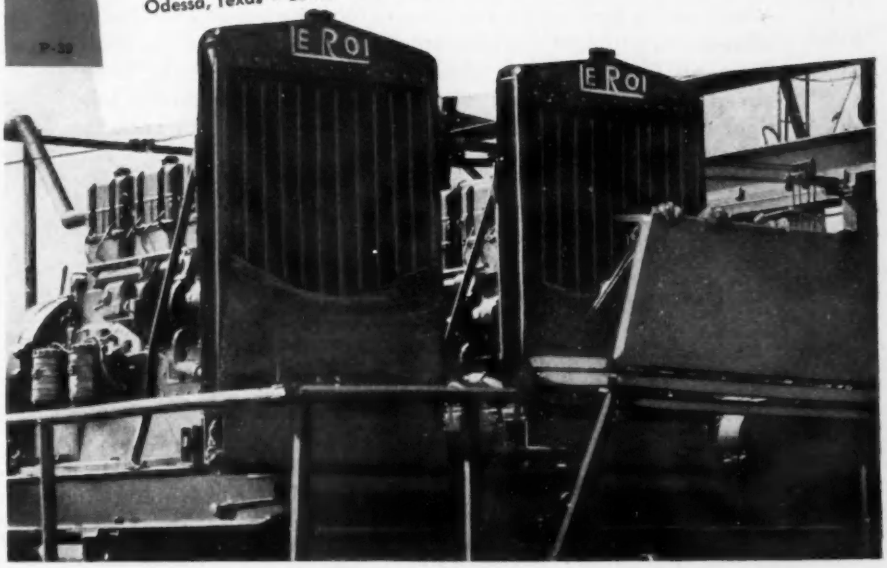
LE ROI MILWAUKEE

P-39



leum-gas in its capacity as a chemical raw material on the return to normal times. Based upon present operations, which find butane-butene and isobutane as the key components for present chemical manufacture, when synthetic rubber and aviation fuel are included, there is a tendency to predict that butanes will be in such demand that a general shift to the lighter product propane will be necessary for the expanion of the liquefied petroleum-gas fuel industry. Rapidly changing conditions suggest that this supposition may not be entirely correct. In fact, some predict just the opposite; i.e., propane will be the key component for chemical manufacture and not butane. In analyzing this situation, (it is estimated that in 1944, liquefied petroleum-gas used as fuel will be less than 20 percent of the total liquefied petroleum-gas used for all purposes), is must be pointed out that with the return to normal times the large quantities of butanes presently going into war material can be made available for peacetime uses. Too, we are now passing from an era of moderate thermal cracking into one in which intensified catalytic operations will predominate. Thus, where butane has been necessary to produce propylene in moderate thermal cracking, catayltic dehydrogenation will permit the use of propane as charging stock when the perfection of a satisfactory separation process is developed. In general, the present trend suggests that acetylene, ethylene and propylene will be the major components in tomorrow's chemical synthesis. The perfection of processes presently under investigation indicates the use of ethane and propane in ever-increasing quantities as raw materials for the production of these chemical components. Naturally, butane will be required as a raw material in many chemical operations, but this demand may not be as exhaustive as predicated by some. Therefore, the return to normal times should see a balanced demand for liquefied petroleum-gas products, allowing this industry to expand and progress in a reasonably stable and desirable fashion.

Prepare for Worst

In a paper[3] presented before an industry association meeting in New Orleans in September, 1944, the author cautioned against the difficulties presently experienced by the warning, " . . . In other words, your immediate program should be to prepare for the worst." This advice still holds true and even after the present heating season is past, the liquefied petroleum-gas industry must continue a program which will enable it to meet its wartime responsibilities.

The difficulties now being encountered by the liquefied petroleum-gas industry to meet its responsibilities may even become more acute. Nevertheless these sacrifices and determined efforts of industry will not go unrewarded because these very experiences are creating an orderly, matured industry insuring a firm foundation upon which will be built tomorrow's modern liquefied petroleum-gas industry.

REFERENCES

[1] "Science in Natural Gas" by James E. Pyne and Frank H. Dotterweich, PAW.
[2] Mineral Market Report No. MMS 1204, U. S. Bureau of Mines, July 15, 1944.
[3] "Will We Weather the Winter?" by Paul K. Thompson, PAW.

Training Plan

■ CONTINUED FROM PAGE 6

year is likely to be centered around this same type of development.

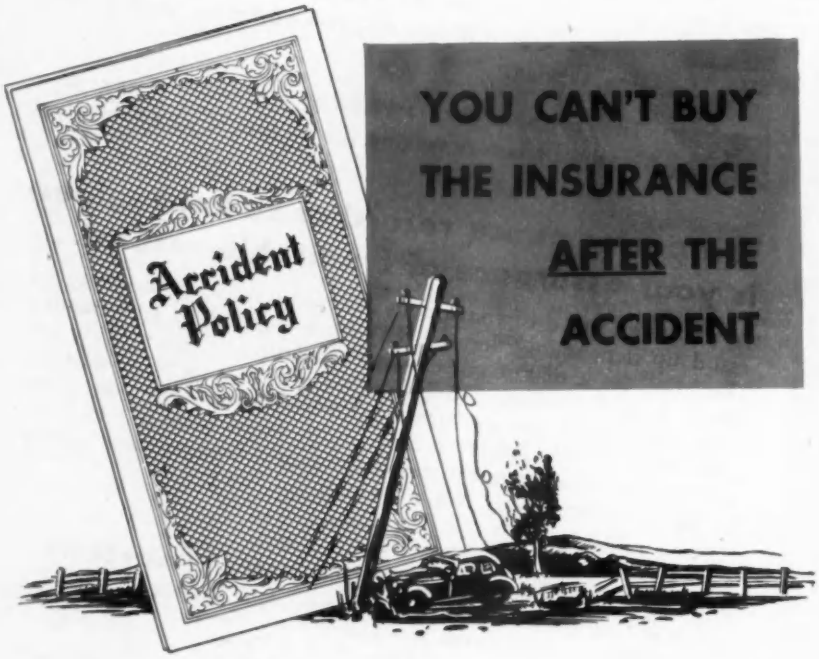
Need for training may also arise from expansion in the industry and the consequent induction of large numbers of new employes. Gasoline and recycling plants present this problem.

The third situation is found more or less constantly: That is, a proportion of the members of any group is always eager to undertake any training that means self-improvement. A few such men are always found in any area where training programs are offered. In Kilgore, for instance, a small group of such men attended classes more or less regularly from June, 1942, to February, 1944, and then merged with larger groups to study the salt water course until July, 1944.

Popularity of this whole plan of training is evidenced by the fact that over 25,000 oil field employes have been enrolled in the program since it was originated.

In Texas since the beginning of the program, more than 26,000 texts or manuals have been distributed by the University of Texas. They have been sent to every state in the Union and to about 28 foreign countries. Since September 1, 1944, or the beginning of this fiscal year, about 900 manuals have been distributed, and manuals have gone to 25 different states, seven foreign countries and the District of Columbia.

It should be understood that the training program is aimed directly for the employed person. Its purpose is not to make engineers or technicians of the stature produced by our colleges and universities. It is for the semi-engineer or technician, and skilled or semi-skilled field worker who wants to improve his knowledge.



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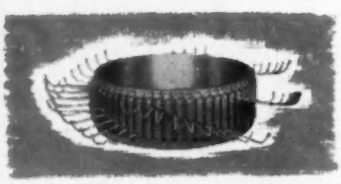

SEND FOR BULLETIN 102

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May Reach Wildcat Goal If January Rate Holds

Data compiled by District Editors and coordinated
By L. J. LOGAN, Associate Editor

EXPLORATORY drilling was carried on during January upon a scale nearly equaling that of December and 31 percent greater than that of January a year ago, completions of this class having averaged 86 per week during the 5 weeks ended February 3, 1945. The 31 percent increase for January over a year ago was better than the gain of about 19 percent for completions of all classes, (THE OIL WEEKLY, February 19, 1945, page 53).

The January rate of completing exploratory tests was upon a basis of approximately 4500 a year. This is short of the 5000 total hoped for during 1945 by the Petroleum Administration for War. It is customary for drilling in general to increase as each year progresses, especially in the summer and fall. With benefit of such progressive expansion of development, the 5000-well goal for this year may be attained. Reaching the goal would necessitate, however, an average of 97 exploratory completions per week for the remaining 47 weeks of 1945, an increase of 13 percent over the actual 86 weekly of January. Actually, it is likely than any increase above January will be gradual, with several early months not greatly different from January. In such case, it may be necessary in the latter part of this year to expand exploration around 20 percent or so above the current rate, if the 5000 well goal is to be reached.

Efficient Rates Exceeded

The trend and outlook on exploration are favorable from the standpoint that activity is upon a comparatively intensive basis, with the industry wildcatting as vigorously as in normal times, in spite of being able to do only sub-normal over-all drilling. However, the situation is not especially gratifying in the light of the generally acknowledged urgent need for much greater than normal exploration to compensate for the continuing abnormally heavy drain on existing proved oil reserves. Not only is it not certain that the 5000-well PAW goal for 1945 will be reached, but it also may be debated whether the goal itself is adequate. Numerous present fields now are producing in excess of efficient rates, while there has been under way for about a decade a process of diminishing returns on wildcatting effort.

Prior to the past 5-year period, the industry drilled less than 3000 wildcats per year, and enough new oil was thereby made available to more than offset current production, with the result that substantial net additions were made each year to producible reserves. In the past 5 years, exploration has been intensified and wildcat completions have been consistently above 3000 annually, having climbed above 4300 in 1944. Yet because there has been a steady decrease in oil found per wildcat drilled, there has been increasing difficulty in finding as much oil as the country has been using. For each of the past 3 years the results have been progressively less satisfactory. In 1944 the nation failed by a third of a billion barrels to find as much oil as it required during the year, in spite of the 4300 wildcat completions. It also had failed to a lesser degree to find as much as consumed in 1943. (For detailed data on the record for recent years in wildcatting and fluctuations in the reserves situation, see Yearbook-Forecast number, January 29, 1945, beginning on page 144).

Men of foresight have been insisting for an extended period that the existing disparity of crude prices and exploration and development costs must lead inevitably to failure to find enough oil. This contention now is being validated by exploratory results. Further intensification of exploratory drilling has become increasingly necessary, and the need for modification of the control of crude oil prices to stimulate wildcatting has become increasingly urgent.

Discoveries and field extensions of January this year were fairly well scattered over the oil regions of the country.

Kansas recorded 9 productive exploratory completions, as also did Oklahoma. Indiana and Kentucky each opened a new oil field and Wyoming scored a new oil field and a new pay. Illinois had four field extensions and found a new producing horizon.

North Louisiana's single strike was a two mile extension of the Lake St. John field while in South Louisiana one oil field was found and new pays established in five fields.

Texas accounted for 26 productive exploratory well completions in January with each of the sections contributing to the total.

■ SEE TABLES ON PAGES 60 AND 61

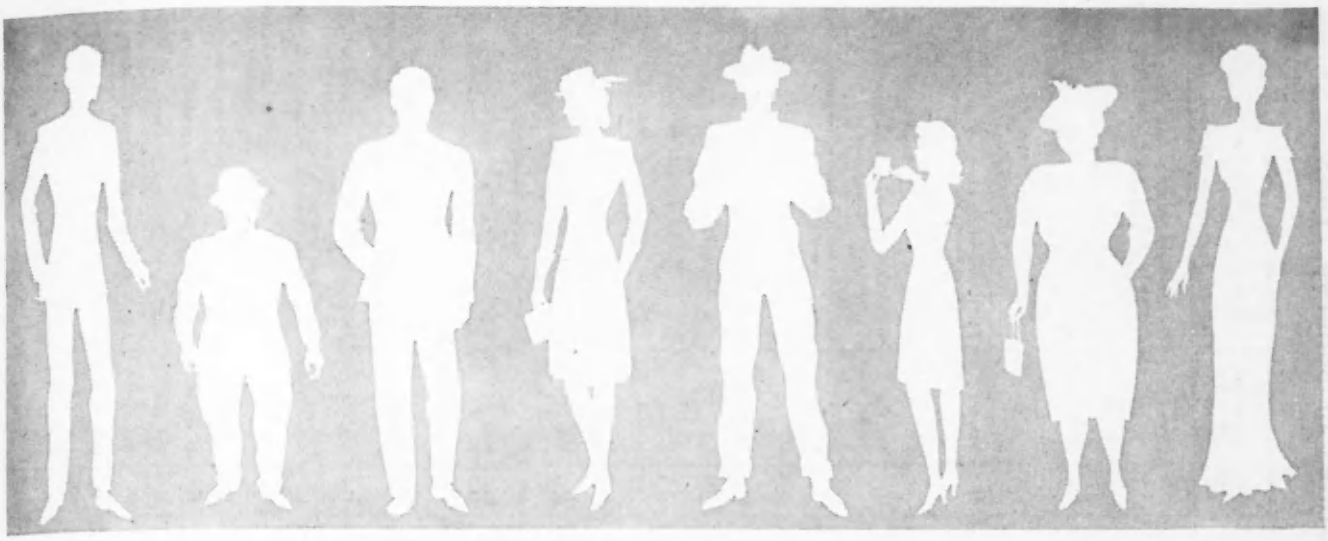
Summary of Results of Exploratory Drilling

ITEM	Jan., 1945	Dec., 1944	Jan., 1944	Percent Diff.
Oil Discoveries	45	63	27	+ 66.7
New Fields	29	43	20	+ 45.0
New Pays	16	20	7	+128.6
Distillate Discoveries	1	3	5	— 80.0
New Fields	1	3	4	— 75.0
New Pays			1	
Gas Discoveries	5	9	7	— 28.6
New Fields	4	8	5	— 20.0
New Pays	1	1	2	— 50.0
Total Discoveries	51	75	39	+ 30.8
Extensions to Fields	11	12	3	+266.7
Oil Fields	10	11	1	+900.0
Distillate Fields				
Gas Fields	1	1	2	— 50.0
Total Productive Tests	62	87	42	+ 47.6
Dry Holes	366	271	285	+ 28.4
(Weekly Average)	73	68	57	+ 28.1
Wildcats	354	266	284	+ 24.6
New Pays	4	4		
Outposts	8	1	1	+700.0
Total Exploratory Tests	428	358	327	+ 30.9
(Weekly Average)	86	89	65	+ 32.0
Percent Productive: (Weekly Average)	15.1	23.6	12.4	
Percent Dry: (Weekly Average)	84.9	76.4	87.6	

Dry hole completions are from weekly reports and totals represent completions for 5 weeks in January, 1945; 5 weeks in January, 1944.

Results of Exploratory Drilling in January, 1945, By Districts

STATE OR DISTRICT	JANUARY, 1945														
	Productive Tests									Total Productive	Unproductive Tests			Total Exploratory Tests	
	New Fields			New Pays			Extensions								
	Oil	Gas	Dis.	Oil	Gas	Dis.	Oil	Gas	Dis		Wildcats	New Pays	Outposts	Jan., 1945	Jan., 1944
Alabama	..	..	..	..	..	..	..	..	..	..	3	..	..	3	..
Arkansas	..	..	..	..	..	..	..	..	..	..	2	..	1	3	3
California	..	..	..	..	..	..	..	..	..	..	26	..	..	26	21
Colorado	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Florida	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Georgia	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Illinois	..	..	..	1	..	..	4	..	..	5	35	..	..	40	35
Indiana	1	..	..	..	..	..	..	..	..	1	11	..	..	12	9
Iowa	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Kansas	5	1	..	1	..	..	2	..	..	9	35	..	..	44	40
Kentucky	1	..	..	..	..	..	..	..	..	1	20	..	..	21	15
Louisiana	1	..	..	5	..	..	1	..	..	7	20	..	1	28	11
North Louisiana	..	..	..	..	..	..	1	..	..	1	15	..	..	16	7
South Louisiana	1	..	..	5	..	..	..	..	..	6	5	..	1	12	4
Michigan	1	..	..	..	..	..	..	..	..	1	23	..	1	25	20
Mississippi	..	..	1	..	..	..	..	..	..	1	14	..	..	15	5
Missouri	..	..	..	..	..	..	..	..	..	..	4	..	..	4	..
Montana	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2
Nebraska	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
New Mexico	..	..	..	..	..	..	..	..	..	..	8	..	..	8	5
Ohio	..	..	..	..	..	..	..	..	..	..	5	..	..	5	7
Oklahoma	6	..	..	1	..	..	1	1	..	9	28	..	..	37	21
Texas	12	3	..	8	1	..	2	..	..	26	114	4	5	149	126
East Texas Border	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..
Rest of East Texas	2	..	..	..	..	..	..	..	..	2	6	..	1	9	19
North Texas	3	..	..	4	1	..	..	..	..	8	25	2	..	35	26
West Central Texas	2	..	..	..	..	..	..	..	..	2	7	..	..	9	9
West Texas	2	..	..	1	..	..	2	..	..	5	24	1	3	33	20
Panhandle	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Upper Coast	..	2	..	3	..	..	..	..	..	5	10	1	1	17	13
Lower Coast	1	1	..	..	..	..	..	..	..	2	23	..	..	25	30
Southwest Texas	2	..	..	..	..	..	..	..	..	2	16	..	..	18	13
South Central Texas	..	..	..	..	..	..	..	..	..	..	1	..	..	1	3
Wyoming	2	..	..	..	..	..	..	..	..	2	2	..	..	4	1
Total United States	29	4	1	16	1	..	10	1	..	62	354	4	8	428	327



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New Oil and Gas Fields and New Pay Horizons Discovered in the United States in January, 1945

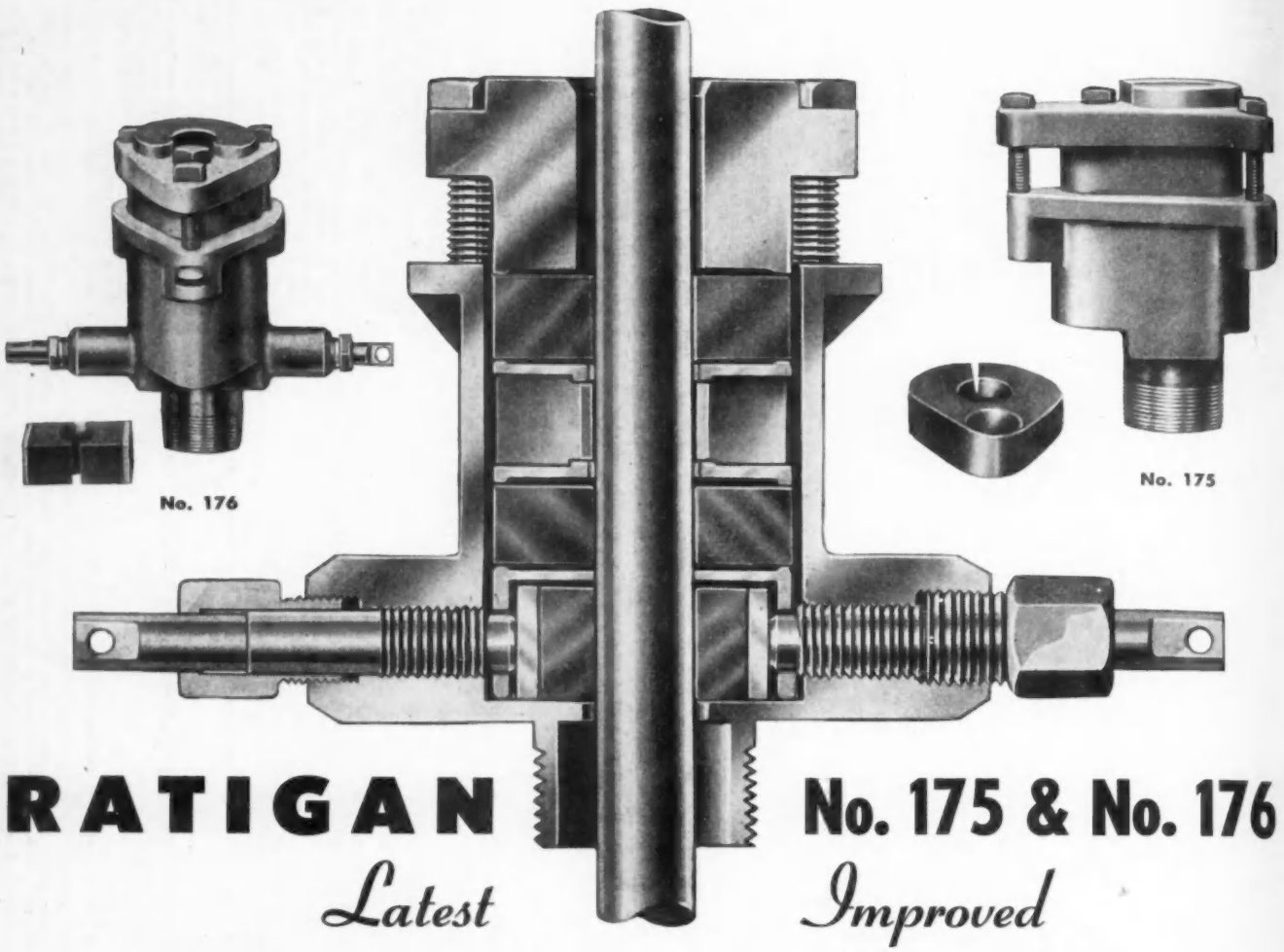
Also Important Extensions to Established Fields

COUNTY	FIELD	COMPANY, WELL AND LOCATION	Date Spudded	Date Completed	Total Depth (Feet)	Completion Horizon (Feet)	[1]Name, Character and Age of Producing Formation	[2]Initial Production Method and Choke	Gravity of Oil	[3]Structure: [4]Method of Discovery	Tentative Evaluation of Discovery or Extension
		ILLINOIS—New Oil Pay									
Jefferson	Woodlawn	Magnolia-Eubank-Winesburgh's Unit 1, sw nw nw 1-3s-1e	.....	1-23-45	1988	1976-1986	Aux Vases sd; Miss.	P 305, 5 wtr	....	.....	OWDD. Formerly prod fr Bethel. S offset since comp for 335 oil, 82 wtr. Some other wells deepening.
		ILLINOIS—Oil Field Extensions									
Clay	Iola	Texas-Wyette's Jones 1, ac se nw, 18-5n-5e	12-17-44	1-30-45	2505	2494-2505	McClosky li; Miss.	P 12, 8 wtr	....	.....	1¼ mi w extension, separated fr pool by 3 dry holes.
Jefferson	King	Strickland's Adams 3, se ne sw 3-4s-3e	11-29-44	1- 9-45	2733	2723-2733	Aux Vases sd; Miss.	P 10; 30 wtr	....	.....	¾ mi s extension.
Madison	Marine	Rockhill's John Becker 1, nw sw se 3-4n-6w	12- 3 44	1- 9 45	1775	1738-1772	Silurian li; Sil.	P 52, 150 wtr	....	.....	¾ mi ne extension.
Richland	Noble	Fulk-Craven's Sager 1, 330 ft fr s line, 330 ft fr e line, n sw 7-3n-9e	11-15-44	1-16-45	3108	3001-3018	McClosky li; Miss.	P 8, 25 wtr	....	.....	¾ mi fr prod, on direct line between prod in ne 7-3n-9e and 13-3n-8e.
		INDIANA—New Oil Field									
Posey	Farmersville	Central States Oil Co.'s Blackburn 1, sw sw nw 20-6s-13w	.....	.....	1117	1104-1117	Sd; Penn.	P 15	....	.....	.....
		KANSAS—New Oil Fields									
Cowley	Unnamed	Creekmore-Rooney's Seacat 1, nwc 26-33s-4e, 1 mi se Fisdale gas area	.....	1-10-45	3113	3103-3108	Chat; Miss.	P 153	41	Ant; dr	Fairly good strike; possible oil development on se flk of Fisdale gas structure.
Ellis	N.W.Catherine	Max Cohen's Madden 1, nw nw ne 4-13s-17w, 1 mi nw Catherine pool	.....	1-29-45	3618	3613-3618	Arbuckle li; Cam.	P 106	....	Str trp; seis, sub	Fair strike along Kansas Uplift trend; may join Catherine pool to prove 640 ac.
McPherson	Unnamed	Bay Pet.-Westgate-Greenland's Myers 1, ne ne nw 7-19s-1w, 1 mi ne Rits-Carlton area.	.....	1-17-45	3013	2928-3013	Chat; Miss.	P 301	....	Ant; sub	Fairly good strike; structure limited in area.
Saline	Unnamed	Mouser Drlg Co.'s Carlin 1, ne se sw 13-15s-3w	.....	1-23-45	3323	3256-3323	Viola li; Penn.	P 77	....	Ant; sub	Unimportant. 4 mi sw Salina pool.
Stafford	Sand Hill	Ed Swearer's Smith 1, swc 19-21s-11w	.....	1-30-45	3556	3550-3556	Arbuckle li; Cam.	P 12, 5 wtr	....	Str trp; dr	Unimportant. 1 mi se Snider pool.
		KANSAS—New Gas Field									
Barber	N. E. Marjorie	Lion Oil Ref. Co.'s Lemon 1, se ne ne 28-30s-13w, 2 mi ne Marjorie pool	.....	1-23-45	4848	4528-4545	Viola li; Ord.	F 18 mln	....	Ant; cd	Good gas reserve; oil possibilities poor; structure may cover 640 ac.
		KANSAS—New Oil Pay									
Barber	N.W. Skinner	Sinclair-Prairie's Oldfather 1, cse 7-31s-14w	.....	1-16-45	4561	4554-4561	Arbuckle li; Cam.	Phy pot 221, 72 wtr	....	D; dr	New deep pay; pool prod fr Viola lime.
		KANSAS—Oil Field Extensions									
Barton	Albert	Nadel-Gussman's Haas 1, se sw sw 30-18s-15w	.....	1- 2 45	3568	3535-3568	Reagan sd; Cam.	P 292	38	Ant; sub	½ mi e ext; opens about 200 ac.
Barton	Hiss	Phillips' Spani 1, ne nw ne 36-20s-14w	.....	1- 2 45	3263	3250-3263	Lansing li; Penn.	F 21; 10 mln	....	Ant; sub	½ mi w ext; flk prod on Kansas Uplift; may develop into gas area.
		KENTUCKY—New Oil Field									
Ohio	E. Livermore	Dameron's Stagner 1, 25-M-30	.....	.....	1419	1388-1419	Bethel sd; Miss.	P 20	....	.....	.....
		NORTH LOUISIANA—Oil Field Extension									
Concordia	L. St. John	Carter's George Murray 1, begin nwc sec 31 go 2920 se alg nl sec th 130 s at ra to lcn in 31-9n-10e.	10- 9 44	1- 8-45	9153	8977-9153	Tuscaloosa sd; U Cre.	F 225; $\frac{5}{32}$"	....	.....	2 mi s ext; proves probably 500 ac and 10,000,000 bbls.
		SOUTH LOUISIANA—New Oil Field									
St. John	Reserve	Atlantic's Lutcher-Moore Lbr. Co. B-1, 1980 n&w of sec 330-10s-6e	.....	1- 6 45	11626	10254-10266	Frio sd; Olig.	F 308	42.4	D; refl seis	Single-well reserve 384,000-400,000 bbls.
		SOUTH LOUISIANA—New Oil Pays									
Beauregard	Mystic	Yegua Corp.'s Lutcher-Moore Lbr. Co. B-1, 1998 fr el 1981 fr no 28-6s-12w	11-30-44	1- -45	8250	8223-8226	Yegua sd; Eoc.	F 172; ½"	46	Drlg	Deeper sand; single-well reserve 200,000 bbls.
Iberia	Avery Island	Humble's Petit Anse Co. B-2, start sec sect 23 go nly alg el sect for 1087 th 1698 wly at ra to lcn in 23-13s-5e on 20-ac tr.	8-23-44	11-12-44	10537	9415-9430	Sand; Mio.	F 194; $\frac{11}{64}$"	33.6	.....	Single-well reserve 480,000-500,000 bbls.
Iberville	Bayou des Glaise	Humble's Wilbert Min. Corp. C-1, start nwc sect 77 to 1333 nly alg wl th ely at ra 13 in 77-8s-8e.	10-11-44	1-23-45	10581	10237-10624	Sd; Mio.	F 321	36.3	.....	Single-well reserve 650,000 bbls.
St. Mary	Belle Island	Sun's Bell Island Corp. 7, 702 s 101 e of nwc 1-18s-10e	8-17-44	12-29-44	8565	8248-8270	Sd; Mio.	F 227; ⅛"	33.6	Drlg	Single-well reserve 528,000 bbls.
Vermilion	W. Gueydan	Pure's Ferguson-Benoit 2, 823.5 s 400 w of nec sw¼ 5-12s-2w	11-17-44	1- 6-45	10772	10050-10070	Sd; Mio.	F 182; $\frac{7}{64}$"	38.7	Flk dr	Single-well reserve 560,000 bbls; se flank.
		MICHIGAN—New Oil Field									
Montcalm	Cato	Gordon Oil's Paris 1, se nw nw 6-12n-8w	7-18-44	1-23-45	3604	3542-3545	Monroe dolo; Dev.	P & F 240; 480 wtr	....	Ant; geol	Small area indicated. 5 mi e Winfield pool.
		MISSISSIPPI—New Distillate Field									
Adams	Carthage Pt.	Pure's McDowell 2, 1600 ft fr sl 2300 ft fr wl 12-6n-3w, 1½ mi se Carthage Pt.	.....	1- 8-45	12149	10273-10286	Tuscaloosa sd; U. Cre	F 91; 1.5 mln; ⅛"	51.7	Ant; seis	Probable extent unknown. Single-well reserve 448,000 bbls dist, 7,360,000,000 cu ft gas.
		OKLAHOMA—New Oil Fields									
Garfield	.....	Cities Service's Mariner 1, nw ne nw 6-22n-3w, 1 mi n Garber pool	.....	1-31-45	5297	5247-5297	Arbuckle li; Cam.	F 2500; 2 mln; ¾"	41.5	Ant; seis	Probably opens major pool alg old Nemaha Ridge trend; likely to extend to old Garber pool; old well 2 mi to n had Arbuckle.
Kiowa	N. E. Hobart	Pure's Hinton 1, se nw nw 10-7n-17w, 2½ mi ne Hobart pool	.....	1- 1-45	1784	1728-1745	Pontotoc sd; Penn.	F 1659	37	Ant; sub, seis	Probably small structure; offsets to e and nw failures.
Lincoln	.....	Midstates Oil Corp.'s Barnes 1, csw se 19-13n-5e, 1¼ mi s Sparks	.....	1-14-45	3800	3640-3655	Prue sd; Penn.	P 50	36	Ant; dr	Old hole abnd 2 yrs ago, re-drilled and re-tested. Looks like fairly good strike; structure extent undetermined.
Oklahoma	Bethany	Phillips-Kerlyn Oil Co.'s Classen 1, cnw se 11-12n-4w, 4 mi nw Bethany	.....	1-16-45	7952	7152-7220	Bois D'Arc li; Sil.	F 200; 7 mln	51	Str Trp; seis	Important strike; considered 5 mi s extension of W. Edmond pool.
Okmulgee	.....	Williams & Copeland's Irby 1, se sw nw 20-16n-12e	.....	1-23-45	2539	2537-2539	Wilcox sd; Ord.	P 60	36	D; sub, dr	Small pool, typical Wilcox "pimple." 2½ mi sw Mounds.
Tillman	S. W. Burt	Gulf's Copeland 1, ne nw 31-1s-18w, 7 mi nw Frederick	.....	1- 4-45	4670	4568-4584	Simpson sd; Ord.	F 31	36	Ant; seis	Small pool along Altus-Tipton trend.
		OKLAHOMA—New Oil Pay									
Caddo	Apache	C. C. Lynch's Peterson 1, ne ne nw 3-5n-12w	.....	1-19-45	814	794- 814	Sd; Penn.	F 33	36	Ant; dr	Affords possible important new, shallow pay.
		OKLAHOMA—Oil Field Extension									
Stephens	W. Marlow	Texas Co.'s Helm 1, sw se nw 21-2n-8w, ½ mi w ext of Marlow pool	.....	1- 4-45	5018	4971-5018	Sd; Penn.	F 127; ¼"	34	Ant; seis, sub	Extends new trend n of Wichita Mts; likely to attract new dev in area where few wells have been drilled.
		OKLAHOMA—Gas Field Extension									
Texas	Hugoton	Phillips' Mina 1, csl n½ 36-1n-13ecm	.....	1-10-45	2970	2856-2970	Krider-Winfield sd; Perm.	F 22 mln	....	Ant; dr	Extends Hugoton gas area 4 mi s.
Wilbarger	Baxterville	Texas Oil & Gas Corp.'s Viola Brown 1-A & Castle Co. 2, 660 fr sl sb-4, 15,000' w nf sl	.....	12-29-44	8015	6380-6382	Sd; Miss.	F 47; 750	42.9	D; seis	Pure sand spot in first well. Single-well reserve 150,000 bbls.
		LOWER TEXAS GULF COAST—New Gas Field									
Jackson	.....	Sterling O & R Co.-Stewart Boyles' H. A. Meyer 1, 550' fr el 620' fr nl 100-ac lse, Sutherland sur, A-75 sect 5, 5 mi s Ganado.	.....	12-23-44	5052	4952-4957	Frio sd; Olig.	F 2.7 mln; ¼"	....	Flt ant; sub	Single-well reserve 2,000,000,000 cu. ft.
		UPPER TEXAS GULF COAST—New Gas Fields									
Wharton	Menefee	Salt Dome Oil Corp.'s Joe Viteral, 1179 fr no 1320 fr wl Henry Mills sur A-270 and blk 1, 366-ac lse	.....	12- -44	5591	5240-5244	Frio sd; Olig.	F	....	.....	Probable single-well reserve 2,000,000,000 cu. ft.

		OKLAHOMA—Gas Field Extension									
Texas	Hugoton	Phillips' Mina 1, esl n½ 36-1n-13ecm	.....	1-10-45	2970	2856-2970	Krider-Winfield sd; Permn.	F 22 mln	....	Ant; dr	Extends Hugoton gas area 4 mi s.
Wilbarger	Burnettsville	LOWER TEXAS GULF COAST—New Oil Field Texas Gas Exploration-Rose, Ed & Dimple Co., 2,640 fr nl sh & 15,992' w of el	.....	12-29-44	8018	8280-8282	Sd; Mio.	F 47½ 7/8" bean	42.9	D; seis	Poor sand spot in first well. Single-well reserve 150,000 bbls.
		LOWER TEXAS GULF COAST—New Gas Field									
Jackson	.....	Sterling O & R Co.-Stewart Boyles' H. A. Meyer 1, 550' fr el 620' fr nl 100-ac lse, Sutherland sur, A-75 sect 5, 5 mi s Ganado.	.....	12-23-44	5052	4952-4957	Frio sd; Olig.	F 2.7 mln; ¼"	....	Flt ant; sub	Single-well reserve 2,000,000,000 cu. ft.
		UPPER TEXAS GULF COAST—New Gas Fields									
Wharton	Menefee	Salt Dome Oil Corp.'s Joe Viteral, 1179 fr no 1320 fr wl Henry Mills sur A-270 and blk 1, 366-ac lse.	.....	12- -44	5591	5240-5244	Frio sd; Olig.	F	....	.....	Probable single-well reserve 2,000,000,000 cu. ft.
Wharton	.....	Texas Co.'s H. R. Matzke 1, start intersect T&NO RR with wl sect 26 I&GN sur A-244 go 3150 ne alg s row of RR th 330 sely to lcn.	12- 4-44	1-10-45	6345	5779-5784	Frio sd; Olig.	F 48.5 mln; ¼"	....	D; seis	Single-well reserve 2,080,000,000 cu ft gas.
		UPPER TEXAS GULF COAST—New Oil Pays									
Brazoria	Danbury s.flk.	Humble's Frank Schmidt 1, 1550 fr nwly/1, 660 fr nely/¼ 150-ac lse and J. H. Brunner sir A-440.	.....	1- 6-45	9284	7542-	Frio sd; Olig.	F 312; ¼"	33.2	.....	Single-well reserve 400,000 bbls.
Ft. Bend	Big Creek	Stanolind's George Lingnau 1, 330 fr sw&nwl 98-ac lse in lot 6 BBB&C sur 1	11-29-44	1-10-45	6465	6272-6465	Frio sd; Olig.	F 235; 1/8"	33.4	Sub geol	1 mi nw extension; single-well reserve 320,000 bbls
Hardin	Silsbee	American Republics-Houston Oil's Fee 10, 5089.9 fr wl 250 fr sl G. W. Brooks sur 7740-ac lse, 933.4 e of No. 6 well.	.....	1- 4-45	8905	7432-	Yegua sd; Eoc.	F 468; ¼"	43.8	.....	400 ft deeper than regular pay. Single-well reserve 480,000 bbls.
		EAST TEXAS—New Oil Fields									
Henderson	Larue	Lone Star Prod. Co.'s R. H. Lee 1, 330' snl 660' wel B. C. Walters sur, 2½ mi n of Athens; 7 mi sw Opelika multi-pay gas-dist field.	9-17-44	1- 4-45	9242	8198-8208	Bacon sd; L Cre.	F 262; 4/32"	47.8	Ant N; geop	Large structure with probable multipays; as discov indicated saturation in Rodessa at 8310 ft and Basal Pettit at 8810-25 ft, both untested. Discov zone comparatively thin.
Van Zandt	.....	Humble's B. W. Bruce Jr. 1, 660' fr sw, 660' fr se lines 120.6-ac tr, 3400' fr ne, 3800' fr se of J. Saligna sur, 2½ mi ne Myrtle Springs.	7-20-44	1- 3-45	8904	8524-8544	Travis Peak sd; L Cre.	P 87.63	37.4	Ant; geop	Prod is subnormal for this depth. Pumping initial, pay zone and thickness comparable with but about 100 ft lower structurally than Fruitvale 2-well pool 3 mi to se.
		NORTH TEXAS—New Oil Fields									
Archer	.....	Chas. E. Morrison-Maguire Industries, Inc.'s W. M. McGregor 4, 197' snl 450' wel of w½ subdiv 7, Brazos CSL A-18,.	1- 1 45	1-18-45	872	861- 872	Cisco sd; Penn.	P 9	....	Ant; geol	Dry holes confine prod area to small pool. Is 3¼ mi se 5360-75 ft Ellenburger pool.
Montague	.....	Texas Co.'s L. A. Hutson 1, 660' out sec G. W. Fletcher sur A-280, 1 mi e Spencer 2700-2800 ft pool.	10-28-44	1-18-45	4185	1913-1928	Strawn sd; Penn.	P 78; 32½ wtr	....	Ant; geol	Not important in view of thin pay and high percentage water.
Young	True, Wedge	R. J. Watson's J. H. Choate 1, 150' snl, 250' wel TE&L Co. sec 254	12-20-44	1-26-45	620	610- 620	Cisco sd; Penn.	P 6; 15 wtr	38	Ant; geol	Not important due to close proximity of decisive failures and small crude yield.
		NORTH TEXAS—New Oil Pays									
Clay	W. Ross	Continental's A. T. Morris 1, 1529' snl 330' wel W. C. Davis sur A-119, 1 mi s by e of 5402-35-ft Bend 1-well pool.	11-12-44	1-15-45	5870	4754-4796	Strawn sd; Penn.	P 30; 15 wtr	41	Ant; geop	Not commercial for this depth; structurally low.
Montague	Hundley	Continental-Sinclair Prairie's J. M. Hundley 1 B, 330' out of s cor 88-ac lse, 3500' fr nw 3300' fr sw lines D. Martindale sur A-465, offsets Bend prod at 6228-54 ft.	9-30-44	1-15-45	6450	5688-5696 5708-5726	Strawn sd; Penn.	P 25; 11 wtr	41	Ant; geol	Failed in reg 6200-ft Bend. Shallower zone not commercial.
Throck-morton	Ewalt	Panhandle Ref. Co.-Anderson-Prichard's W. B. Ewalt 2, 1400' snl 1500' ewl sec 2185, TE&L sur, ½ mi w Bend li disc at 4156-61 ft.	9-23-44	1-12-45	5028	4802-4807	Li; Miss.	P 50; 40 wtr	41	Ant; geol	Subnormal pumper for depth, but lower pay will probably be more prod near apex of structure.
Young	Burns-Larimore	L. T. Burns' E. J. Larimore 2-A, 938' snl 1134' wel TE&L sec 150; 840' fr 4900' Miss prod.	12-11-44	1-20-45	3324	3319-3324	Strawn sd; Penn.	P 75; 35 wtr	41	Ant; geol	Developed fr information gained in drlg to Mississippian; not important as only small Strawn area.
		NORTH TEXAS—New Gas Pay									
Young	Fleming-Graham	Fleming Oil Co.-Kimbell Corp.'s M. K. Graham 4, 700' ewl 385' snl TE&L Co. sec 2912, adj to 4300-ft Marble Falls and 4600-ft Miss oil prod.	10-15-44	1- 1-45	608	490- 495	Cisco sd; Penn.	F 5 mln	....	Ant; geol	Unimportant except as fuel supply for lse operations.
		SOUTHWEST TEXAS—New Oil Fields									
Jim Hogg	.....	F. B. Lefevre's A. Martinez 1, 2535' fr nl 330' fr el blk 91 of subdvn of sh 2, Las Animas gr, 240-ac lse.	.....	12- 1-44	2007	1767-1773	Jackson sd	P 10; 4 wtr	19.3	.....	Unimportant. Single-well reserve est 60,000 bbls.
Starr	Unnamed	George Irving's M. M. Garcia B 1, 330 fr e&sl blk 12 sh 7-B porc 91, 40-ac lse.	12-13-44	1-15-45	4264	4080-	Vicksburg sd; Olig	F 120; 8/64"	....	Sub geol	Single-well reserve 144,000-150,000 bbls.
		WEST CENTRAL TEXAS—New Oil Fields									
Jones	.....	Hunt Oil Co.'s T. J. Amason 2, 3528' nsl 2997' ewl Samuel Jones sur No. 226, 1½ mi sw Freeman pool.	.....	1-28-45	3608	3592-3607	Canyon sd; Penn.	P 126	40	Ant; geol	4000 ft ne company's 4470-ft failure. Reg shallower pays not present. Prod area will be small.
Jones	.....	Texas Co.'s M. A. McCright 1, 3500' nsl 330' wel Stephen Scallorn sur No. 280, ¾ mi nw and separated by failures fr nearest prod.	10-31-44	1- 4-45	3210	2518-2546	Noodle Crk; li; Penn.	P 44; 4 wtr	39	Ant; geol	Not important as due to be sml prod area.
		WEST TEXAS—New Oil Fields									
Dawson	Welch	Richmond Drlg Co.'s J. W. Nelson 1, c sw nw E. L. & Ry Co., 34, blk M, 2½ mi n by w of Welch pool's active pumper.	8-16-44	1— 9-45	5003	4805-4923	San Andres li; Perm.	P 167	33	Ant; geol	Pot includes accumulated fluid; probably settle to 50-60 bbl pumper. No appreciable volume of gas in area.
Ector	TXL	Shell-Cities Service's T. P. Land Trust 1, 664' nsl 667' wel T&P Ry., 7, blk 45, T-1-S; 3⅛ mi ne Wheeler-Ellenburger fld, nearest prod.	5-12-44	1- 3-45	10181	7886-8020	Li; Devo.	F 1911; ½"	41	Ant; geop	Important discov with area having possible prod in 7000-ft Permian and 8800-ft Silurian; Ellenburger eliminated by abundance of sulphur water. Top of Ellenburger correlates 802 ft high to nearest Wheeler-Ellenburger well, and considered separate geol features.
		WEST TEXAS—New Oil Pay									
Crane	Crossett	Texas Co.'s C. W. Hobbs B 3, c n¼ of s¼ H&TC Ry. 33, blk 35, 1⅛ mi n by w of 5300-ft Devonian prod.	8-29-44	1-16-45	6710	3190-3210	Holt li; Perm.	F 221; 55 wtr	42	Ant; geol	Entered Devonian at 5110 ft, 243 ft high and void of porosity. This new and shallower pay may embrace greater prod area than Devonian zone.
		WEST TEXAS—Oil Field Extensions									
Andrews	Union	Union Oil Co. of Cal.'s J. D. Biles 6, c se ne PSL sec 9, blk A-31, 1¼ mi n by w of fld.	5-11-44	1-13-45	7460	6950-7406	Clear Fork li; Perm.	P 50	41.8	Ant; geol	Structurally low and thick sect of broken pay subnormal in porosity.
Cochran	Slaughter	Honolulu Oil Corp.'s R. M. Hudson 1-9, 700' nsl 1860' ewl PSL sec 9, blk P, 3¼ mi sw Slaughter fld.	9-27-44	1-25-45	5153	5120-5125	San Andres li; Perm.	P 111; 5 wtr	32.2	Ant; geol	No failures between Slaughter fld and this outpost, which is flat structurally but prod fr near water table. Acid used prior to plugging back.
		WYOMING—New Oil Fields									
Carbon	Bailey Dome	Sinclair Wyoming Oil Co.'s Milton Coffman 1, se ne ne 21-26n-89w, 18 mi n Rawlins.	10- -44	1-28-45	5234	5145-5190	Tensleep sd; Penn.	F 624; 2½"	37.2	D; sur seis	Not considered major strike, as water found in bottom of Tensleep and as structure has only sml amt closure. Deeper Sundance, not yet drilled, may add more oil. Next well planned to test deeper prospects.
Hot Springs	Kirby Creek	Pacific Western Oil Corp.'s Gov't 1, se ne ne 21-43n-92w, 14 mi e Thermopolis	9- -44	1-24-45	4427	3420-3445 3461-3493	Embar; Penn.	P 20	20	Ant	Expected to cover small area and be of small importance.

[1] Character of producing formations abbreviated thus: ch, chalk; dolo, dolomite; li, limestone; sd, sandstone; sh, shale; ser, serpentine; cgl, conglomerate. Ages of formations abbreviated thus: Pleis, Pleiocene; Plio, Pliocene; Mio, Miocene; Olig, Oligocene; Eoc, Eocene; U. Cre, Upper Cretaceous; L. Cre, Lower Cretaceous; Jur, Jurassic; Tri, Triassic; Perm, Permian; Penn, Pennsylvanian; U. Miss, Upper Mississippian; L. Miss, Lower Mississippian; Devo, Devonian; Sil, Silurian; Ord, Ordovician; Cam, Cambrian.

[2] Barrels of oil per day (24 hr. rate), flowing (F), pumping (P), swabbing (Sw), or bailing (B); or million cubic feet of gas daily open flow capacity; size of choke given in inches. [3] Type structure abbreviated as follows: Ant, Anticline; D, Dome; Fld, Fold or Folded; Flt, Fault or Faulted; M, Monocline; N, Nose; SD, Salt Dome; Str trp, Stratigraphic trap; Syn, Syncline; Ter, Terrace. [4] Method of discovery abbreviated as follows: cd, core drilling; dr, drilling; geol, geology; geop, geophysics; grv, gravity meter; ran dr, random drilling; seis, seismograph; sub, subsurface geology; sur, surface geology.



RATIGAN No. 175 & No. 176

Latest Improved

STUFFING BOXES

The Ratigan No. 175 and No. 176 are the only self-oiling stuffing boxes on the market, receiving their lubrication directly from the pumping well.

They both function exactly the same except that the No. 175 has no shut-off feature. The hole in the rubber is made for the size of the polished rod; while the holes in the metal parts of the body are larger. This design makes the polished rod self-aligning.

The inside of the box is removable, so that the device has two oil chambers. Another arrangement inside the body keeps the two chambers filled with fluid from the well. This method of self-lubrication, without depending on the human element, is an excellent feature in itself.

The Ratigan No. 176 Stuffing Box can be shut off while repacking the box, by tightening the screws evenly in the shut-off; but caution must be exercised as the screws will have to be loosened before the well starts to pump. If not, the fluid will not get up into the stuffing box.

When the screws are not tight against the rubber, the stuffing box is free to function properly. For a further check on the fluid coming up through the bypass, the pumper may loosen the plug in the cap a little, and if the bypass is free the oil will flow immediately. If the oil does not come through, the screws in the shut-off are too tight.

When repacking Ratigan Stuffing Boxes, both rubbers must be removed. Instructions for installing are supplied to oil companies and supply stores on request, and are attached to each box on all foreign shipments. Specify size and type of thread, and size of polished rod, when ordering.

J. P. RATIGAN

1213 SOUTH SANTA FE AVENUE **LOS ANGELES 21, CALIFORNIA**

Ratigan Products Are Sold Through Leading Supply Stores

Crude Output at New High and Runs to Stills Near Peak to Meet Heavy Needs

The industry, during the week ended February 17, increased crude oil production to a new all-time peak and stepped up refinery runs to within 11,000 barrels of the highest daily average on record. Thereby, the drawing on stocks of distillate fuel oil and residual fuel oil was slowed down, while seasonal building up of gasoline stocks continued normal.

United States crude production averaged 4,780,000 barrels daily during the week, an increase of 52,000 over the previous week, as well as a new high. The output was greater than in the 4,384,000 daily in the corresponding week a year ago by 396,000 barrels daily, or 9 percent. Highest production on record heretofore was 4,762,000 daily, covering the week ended September 30 last year.

Crude runs to stills averaged 4,787,000 barrels per day, up 17,000 from the week before, and compared with the record high of 4,798,000 barrels a day in the week ended December 30, 1944. The latest figure represented an increase of 346,000 barrels daily or nearly 8 percent over the 4,441,000 a day run to stills in the week ended February 19 last year.

With runs to stills close to or exceeding domestic production in recent weeks, it has been necessary to furnish refineries party from storage, and in the week ended February 10 crude stocks were reduced by 2,780,000 barrels, an average of almost 400,000 barrels daily. They declined to 218,894,000 barrels, a new low since 1921, or for nearly a quarter of a century, having been low at that time following the shortages of the World War I era.

Gasoline production averaged 2,130,000 barrels daily in the week of February 17, down 12,000 from the week before although 212,000 daily or 11 percent above output in the corresponding week a year ago. Stocks of finished and unfinished gasoline accumulated at the rate of 318,000 barrels daily, having risen from 92,455,000 to 94,680,000 barrels. The latter quantity was 11,378,000 barrels or nearly 14 percent more than the 83,302,000 barrels on hand February 19 a year ago.

Production of gasoil and distillate fuel oil averaged 722,000 barrels daily, up 70,000 from the previous week and 81,000 daily or almost 13 percent more than output in the like week last year. Stocks of these light fuel oils were drawn upon seasonally, nevertheless, by 97.000 barrels daily and declined to 29,864,000 barrels, a quantity 4,000,000 barrels or 12 percent less than the 33,914,000 barrels reported as of February 19 a year ago.

Residual fuel oil production of 1,319,000 barrels daily was practically the same as in the previous week, and was 64,000 barrels a day or 5 percent greater than output in the corresponding week a year ago. Stocks of residual were reduced at the rate of 86,000 barrels daily, having come down to 48,240,000 barrels, a new low for recent times. That amount was 4,454,000 barrels or 8.5 percent less than the 52,694,000 barrels on hand February 19 last year.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.
(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1941	4,337	11–22	4,120	10–18	266,187	3–29	99,727	3–29	[1]54,983	11–15	102,448	1– 4
1942	4,337	2– 7	3,961	1– 3	263,208	3–28	[1]109,281	3–14	47,861	11–14	95,857	1– 3
1943	4,436	11–13	4,331	12– 4	245,752	5–29	94,159	3–20	47,187	11–27	72,881	1– 2
1944	4,762	9–30	[1]4,798	12–30	240,992	1– 1	89,162	4– 1	48,863	10–28	64,644	10– 7
1945	[1]4,780	2–17	4,787	2–17	221,628	1–20	94,680	2–17	38,298	1– 6	56,074	1– 6
Lows:												
1939	[3]1,601	8–26	3,125	2–18	[2]229,127	10–12	71,152	10– 7	20,722	4–15	105,397	4– 8
1941	3,364	1–11	3,490	1–18	240,399	11–15	79,923	10– 4	28,382	4–12	90,914	7–12
1942	3,297	7– 4	3,393	5–23	231,896	12–12	75,934	12– 5	29,240	4–25	72,962	12–26
1943	3,821	1– 9	3,579	3–13	232,191	1– 9	68,182	10–16	30,732	4– 3	57,596	12–25
1944	4,357	1– 1	4,228	2–12	220,258	9– 9	76,302	1– 1	30,232	4–29	49,737	3–18
1945	4,678	1– 6	4,656	1– 6	[4]218,894	2–10	86,616	1– 6	29,864	2–17	48,240	2–17

TRENDS OF 1944 AND 1945

Trends in Week Ended:	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1944:									
January 1	4,357	4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,409	4,359	240,251	13,427	81,075	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,013	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 29	4,431	4,300	235,342	13,126	88,462	4,284	30,236	8,398	49,985
May 27	4,514	4,532	234,423	13,502	86,468	4,702	32,035	8,568	49,812
July 1	4,587	4,638	228,860	14,052	83,559	4,496	35,360	8,872	52,235
July 29	4,608	4,627	225,112	14,115	82,665	4,833	38,135	8,900	56,280
August 26	4,667	4,698	222,931	14,112	80,740	4,566	41,453	8,680	59,839
September 30	[1]4,762	4,775	222,393	14,494	78,028	4,622	45,329	9,292	64,226
October 28	4,740	4,658	223,235	14,117	79,058	4,772	48,705	8,985	64,382
December 2	4,712	4,693	221,591	14,853	80,427	4,082	45,832	8,981	61,727
December 9	4,704	4,552	[4]220,258	14,611	80,880	4,056	44,436	8,923	60,458
December 16	4,695	4,537	222,075	14,145	82,747	4,353	42,413	8,727	59,280
December 23	4,729	4,682	222,575	14,635	83,355	4,605	40,846	8,798	58,509
December 30	4,705	[1]4,798	222,998	15,342	86,614	4,257	39,495	9,156	57,430
1945:									
January 6	4,678	4,656	220,331	14,472	86,616	4,533	38,298	9,092	56,074
January 13	4,722	4,570	221,114	14,139	87,814	4,408	36,410	8,993	54,207
January 20	4,733	4,686	221,628	14,554	88,708	4,586	35,041	9,082	52,554
January 27	4,727	4,756	221,310	14,957	88,223	4,843	33,651	9,252	51,119
February 3	4,723	4,662	221,674	14,535	91,034	4,559	32,370	9,377	50,451
February 3	4,723	4,662	221,674	14,535	91,034	4,559	32,370	9,377	50,451
February 10	4,728	4,770	[4]218,894	14,996	92,455	4,565	30,544	9,237	48,845
February 17, 1945	4,780	4,787	.....	14,910	94,680	5,053	29,864	9,234	48,240
February 19, 1944	4,384	4,441	[5]238,206	13,429	83,302	4,483	33,914	8,789	52,694
Change:									
In week	+52	+17	—2,780	—86	+2,225	+488	—680	—3	—605
In year	+396	+346	—19,312	+1,481	+11,378	+4570	—4,050	+445	—4,454
In year	+9.0%	+7.8%	—8.1%	+11.0%	+13.7%	—12.7%	—11.9%	+5.1%	—8.5%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since December, 1921. [5] Stocks, February 12, 1944.

Phillips' $449,562 Bid Wins Oklahoma City Lease

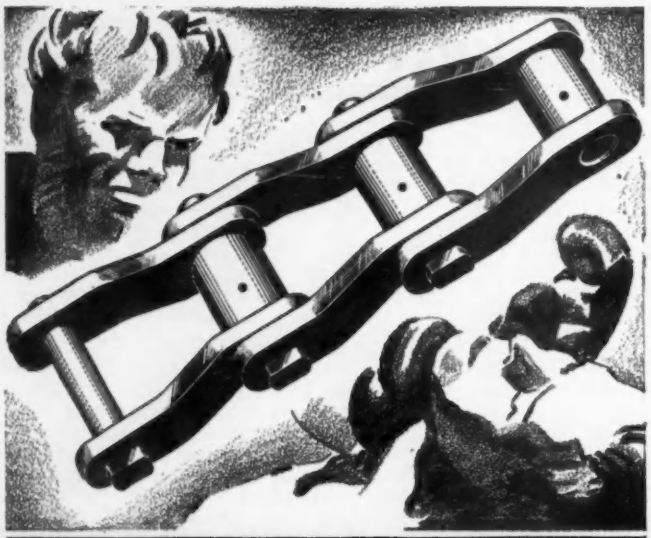
Phillips Petroleum Company, with a bid of $449,562.33, was granted a lease by Oklahoma City to 941.40 acres comprising the municipality's Bluff Creek reservoir properties. The tracts are located in Tp. 12-4w and Tp. 13-4w and range in size from a half-acre to quarter sections. The land is in the vicinity of Phillips Classen 1, big gas-distillate discovery near Bethany in Oklahoma County.

Pressure Maintenance Plant Is Completed

A 60-million-cubic-foot capacity pressure maintenance plant, constructed for Trinity Gas Corporation in the Sejita field, Duval County, Texas, is now in operation. The plant is designed to produce approximately 1500 barrels of petroleum products daily, including aviation gasoline.

Gas from 15 wells in the Sejita field is processed at 1700 pounds per square inch and is then compressed to 2500 pounds and returned to the field sands.

The Sejita plant was designed by Hudson Engineering Corporation, Houston.



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A. P. I. No. 4 P Union *Toolpusher* No. 1240-RXX
A. P. I. No. 4 P Union *Driller* No. 1240-R 4
A. P. I. No. 4 C Union *Roughneck* No. 1240-RX
A. P. I. No. 3 P Union *Toolpusher* No. 1190-RXX
A. P. I. No. 3 P Union *Driller* No. 1190-R 3
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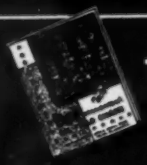

Union Bulletin O-1 covers Oilfield Chain. Ask for your copy.

UNION CHAINS

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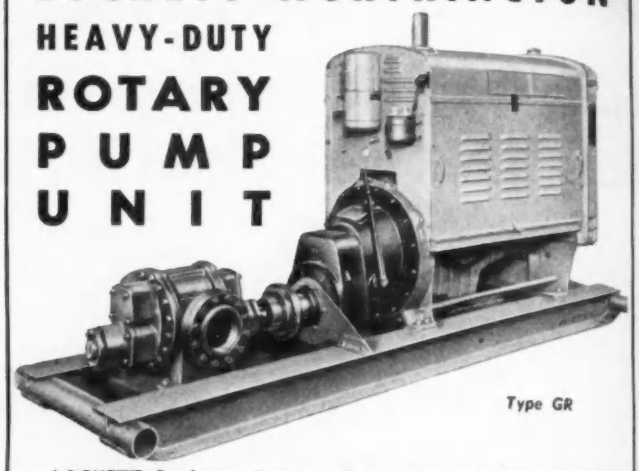

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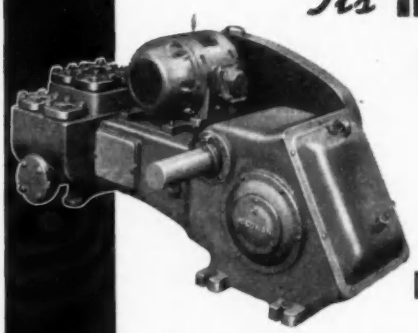

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Pipe Line Review

Pipe Line Outlet Slated For Wharton County Pool

Sinclair Refining Company is providing a pipe line outlet for the El Campo pool, Wharton County, through the construction of a 3-mile, 3-inch lateral off its Corpus Christi-Houston trunk line. O. C. Whitaker Company, Fort Worth, began laying the pipe last week.

21 Miles of Line Laid For Lone Star Gas Firm

Anderson Brothers, Houston contractors, last week finished laying 21½ miles of line in the Lone Star Gas Company gathering system, Buffalo field, Leon County, Texas.

The line consists of ½-mile of 2-inch, three miles of 4-inch, two miles of 6-inch, and 16 miles of 8-inch pipe and included a crossing of the Trinity River.

Work Begins on 25-Mile 6-Inch Ector County Line

Swinerton and Walberg, Houston contractors, have begun relaying 25.2 miles of 6-inch line from the Goldsmith and Penwell fields, Ector County, Texas, to Shell Pipe Line Corporation's pumping station near Crane. The line is to be completed in late March.

Woodsboro-Aransas Pass Gas Line Is Completed

C. W. Sternberg, Houston contractor, last week completed 19 miles of 8-inch gas line for United Carbon Company.

The line extends from the LaRoca field, Woodsboro, Texas, to United's carbon plant near Aransas Pass.

23-Mile Line Completed To New Crooks Gap Pool

Sinclair Wyoming Oil Company has completed 23 miles of 8-inch pipe line from its Lost Soldier pump station to the new Crooks Gap pool in Fremont County, Wyoming. Survey has been completed to extend this line for another 35 miles to connect another Sinclair oil discovery at Big Sand Draw field.

Gulf Completes Test of Winkler-Midland Carrier

Gulf Refining Company has completed testing its 62-mile, 8-inch sweet crude carrier that extends from the Keystone-Ellenburger field, Winkler County sector of West Texas, to its Midland terminal, where 80,000-barrel tanks have been added to its tank farm to accommodate the high-grade crude for batching in 100,000-barrel shipments through its looped 10-inch line that extends to Port Arthur.

The company will begin handling the allowable of the 16 Ellenburger wells, which have an allowable of 300 barrels daily each, on March 1, relieving Magnolia Pipe Line Company of the transportation between the field and Midland.

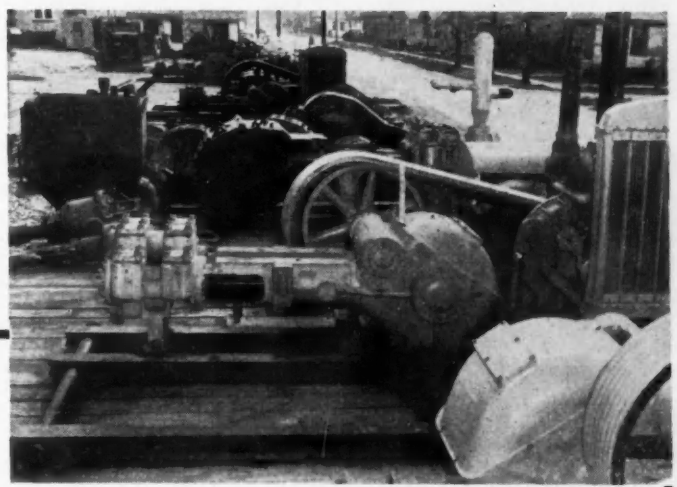
Second-hand pipe salvaged from idle lines in Oklahoma and Texas was used in building the Keystone-Midland unit, which has been tested with water at 750 pounds pressure. A temporary field booster unit will provide power for the handling of 500 barrels of oil hourly until a permanent station is erected at the field end of the 8-inch discharge line in NW¼ Sec. 10, Block B-3, PSL survey.

Missouri Line Relaid

Anderson Brothers, Houston contractors, last week completed taking up and relaying four 8-inch crude lines totaling 10,000 feet across the Grand River near Brunswick, Missouri, for Sinclair Refining Company.

Wilbarger County-O'Dell Pool Pipe Line Completed

The Bell-Western Corporation, Tulsa, has completed its pipe line extension from the Fargo pool in Wilbarger County, Texas, to the new O'Dell pool. The line is 4½-inch with gathering lines of the same diameter but of light weight pipe. Ben Franklin Refining Company, wholly-owned subsidiary of Bell Oil & Gas Company, has purchased a tank station site in Marshall County and constructed a pipe line to the site from the Aylesworth pool.



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German Gasoline Production Slashed 80 Percent Since April of Last Year

Germany's refineries and all but four of her synthetic oil plants are now inactive, according to Allied headquarters. Bombings have been so continuous and so effective that in spite of concentration of attention on quick repairs to plants turning out vitally needed gasoline, the Germans have reached the point where they are unable to turn out the required new materials and equipment to get the plants back into operation.

Careful check of plant capacities, according to Allied intelligence officials, reveals that total gasoline output of the Reich at the present time does not exceed 690,000 barrels per month—a drop of 2,660,000 barrels, or nearly 80 percent below the figure for April, 1944.

A contributing factor is the capture of producing fields and refining centers of Roumania, Hungary and Poland, in addition to the minor potential of Yugoslavia. This leaves only the output of Austria and Germany proper to supply crude oil needs. Without the refineries the oil fields are of little direct value in Germany's emergency, though it is probably true that the Austrian fields alone have been developed to the point where they are now capable of producing approximately 30,000 barrels per day. Too, several important new fields have been opened in northwestern Germany, southern Denmark and northern Holland, as a result of intensive exploration.

While reserve stocks of gasoline in Germany are definitely known to be too low for sustained military operations, it may be possible to use them for carefully spotted counter offensives, such as that which produced the Belgian "bulge"; but such drives can only be considered to be the products of desperation.

Germany may have a carefully hoarded backlog of gasoline stocks, since her total output was in excess of military needs until the Allies began their systematic campaign of bombing out refineries and synthetic plants.

Last year at this time there were 81 major refineries and synthetic oil plants under German operation and control. Of this number 36 have since fallen into the hands of the Allies, and all but four of the remaining 45 have been knocked out. Two of these four are in a damaged condition and will very likely be out of commission in a matter of days.

For the purpose of comparison of relative strengths in gasoline "budgets," it can safely be estimated that raids involving 4000 planes, such as the British and American air forces staged over Germany on February 15, require something like 1,125,000 barrels of high octane gasoline for a six-hour round trip. This amount is being turned out by American plants in slightly more than 2 days. At Germany's present reduced capacity this would represent her total output of all gasoline grades over a period of seven weeks.

The German production ministry is now engaged in expanding underground storage installations and is attempting to build and install numerous "midget" crude oil processing units near producing fields. It is the opinion of military experts, though, that it is too late for Germany to hide any effective proportion of her refining facilities. Such a program should have been started long ago.

Venezuela Concessions To Be Awarded Soon

Concession titles will be issued shortly by Venezuela on extensive new holdings in the eastern producing region, following announcements of acceptance of petitions submitted by four major operating companies.

Venezuelan Oil & Transport Company (Dutch Shell) has won favorable action on solicitation of 68 parcels totaling 30,909 hectares, chiefly in the district of Bruzual, northwestern Anzoategui, but including several small tracts in the district of Cajigal to the south. Initial exploitation tax will be 50 bolivares per hectare for all 68 parcels.

Creole Petroleum Corporation will be granted rights on 47 tracts of 500 hectares or less, totaling 22,900 hectares, located mostly in Piar and Maturin, Monagas, with a few parcels in the district of Bolivar included. Initial exploitation taxes on the properties range from 40 to 2000 bolivares per hectare, the latter being on tracts close to production in the Jusepin field.

New Mene Grande acquisitions include 17 tracts, totaling 7710 hectares, located in Cajigal and Aragua in northwestern Anzoategui, at initial exploitation tax rate of a flat 50 bolivares per hectare.

Texas Petroleum Company has been awarded concession rights on three small tracts totaling approximately 3000 hectares south of the Santa Barbara-Mulata field, in Maturin, Monagas, at an agreed initial exploitation tax rate of 300 bolivares per hectare.

Venezuela Has Minimum Of 5388 Producing Wells

At the beginning of January there were a minimum of 5388 producing wells in Venezuela, including those shut in because of lack of outlet facilities. Of this number, 4069 were in the Lake Maracaibo and adjoining area in Zulia and western Falcon states, and 1319 in eastern Venezuela.

Concession Renounced

Texas Petroleum Company has renounced its concession rights on 19 parcels of land in the vicinity of the Texas 2 dry wildcat recently completed north of Tucipita, in Delta Amacuro, Venezuela. Area of the renounced parcels is approximately 19,000 acres.

Russia Gets Production From Lower Devonian

A deep test in the Tuimazy oil field, 60 miles west of Ufa in Bashkiria, was completed in September as a Devonian producer with initial production of 1120 barrels per day. This is the first production from lower Devonian strata in Russia, although 2 wells were being operated at the time in the Yablonovag field in the Samara Bend of the Volga, which are bottomed at higher levels in the Devonian series. Combined output of the two latter wells was reported to be 2800 barrels daily.

Following the Tuimazy deep discovery, the Soviet government ordered immediate test drilling to Devonian depths in other fields within the area of jurisdiction of the Kuibyshev Oil Combine and in the Molotov Oil Combine area to the north, where the Kama River fields are located.

Subsurface Geology of Colombia Area Uncertain

Lack of discernible stratigraphic breaks in cuttings, cores or electric logs has given rise to uncertainty regarding the subsurface geology of the Sinu River area of Colombia, where Syndicato de Inversiones is drilling Floresanto No. 1 wildcat.

On February 7 coring was being resumed after a second electric log of the hole had been run to 5767 feet. Caving troubles in the continuous shale section have made it advisable to drill a small hole, to be reamed later before casing strings are set.

It is uncertain whether hole is being made in Oligocene or Miocene strata, but the operators have decided to carry it through the entire sedimentary section if possible to test Eocene and Cretaceous levels.

It is probable that shallow core holes will be drilled at a number of localities in the concession in the immediate future to supply more definite geological control.

Lease Bids Received

Sealed bids for oil and gas leases covering 7045.81 acres of restricted lands of the Five Civilized Tribes will be received up to 10 a.m., March 13, at the office of the superintendent in Muskogee, Oklahoma. Counties in which leases are located include Adair, Tulsa, Creek, McIntosh, Okfuskee, Hughes, Seminole, Coal, Pontotoc, Garvin, McClain, Grady, Stephens, Murray, Carter, Jefferson, Love and Marshall.

Clarey Resigns

Standard Oil Company (New Jersey) announces that Northrop Clarey, assistant to the president for the past nine years, has resigned that post, but will continue with the company on special duties.

He has been with the company for 25 years and was formerly associated with the National City Company, the *Wall Street Journal* and the *New York Times*.

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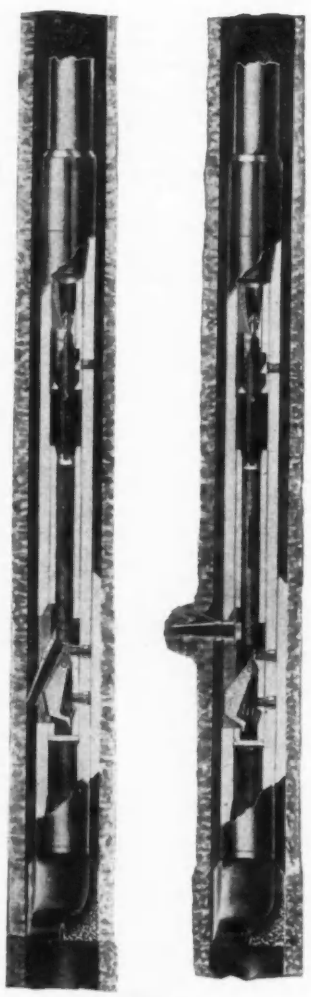

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Oklahoma

Garfield County Registers Second Strike in Month

Garfield County gets second oil strike in month; prolific deep sand found in Hoover Northwest pool; Amerada wildcat flows by heads; harp well nears Wilcox; East Pauls Valley development hits brisk pace; Layton sand wells blow out.

Garfield County: Con-Tex Petroleum et al's strike near the old Barnes pool in Wolfe 1, NE SW SW 34-24n-3w, about 6 miles northeast of Cities Service's Mariner 1, recent important pool opener in the Arbuckle, averaged 42 barrels of oil an hour for 8 hours with 2 million cubic feet of gas from Wilcox sand from 4833-47 feet, total depth. After initial test the well was shut in for pipe line connections. Sinclair-Prairie Oil Company is expected to extend its line to the new area.

Garvin County: Helmerich & Payne, Inc., of Tulsa, opened a new deep pay in the Hoover Northwest pool when Gaither 1, SW SW NE 14-1n-1w, flowed at the rate of 675 barrels a day from 2 Upper Pennsylvania zones logged at 2446-60 and 2468-97 feet. Operator said it was a "fine well" and revealed that a third producing horizon was logged and cased off from 2154-2205 feet. Production in the area ranges from 1055 to 1400 feet. The pool is fast becoming one of major proportions with reserves now estimated between 7 and 9 million barrels. Well was shut in awaiting tankage. Operator's Kelly 1, NE NE SW of section 14, looks good for a still deeper zone with saturation reported at about 2620 feet. Pipe has been set and the well was preparing to test.

Bryan County: West of Mead, Amerada Petroleum Corporation has a potential pool opener in Williams 1, NE NE SW 27-6s-7e. With pipe perforated in the upper Bromide zone at 2910-30 and 2965-3005 feet, the well flowed approximately 90 barrels of oil in 8 hours by heads. On previous test the well, after an aicd shot, flowed about 60 barrels of oil in 8 hours.

Cleveland County: O. G. Harp's Mattheson 1, NE NW NE 19-10n-2w, east of Moore which had short-lived flush production from the Bartlesville zone last month before bridging over, was being closely watched as the wildcat neared the Wilcox zone. It was drilling below 8650 feet with the Wilcox expected at 8750 feet.

Logan County: Fox & Fox Hudson 2, SW SE SE 26-17n-4w, in the Layton sand zone of the Crescent pool, reported 2 blow-outs before being brought under control. With pipe set at 4868 feet, top of the sand, when plug was drilled the heavy pressure blew tools out of the hole. After shutting in the flow a mastergate valve cracked and the well went on the rampage again before it was finally subdued after flowing an estimated 825 barrels plus 3 million cublc feet of gas daily. Operatros are preparing to resume testing. Their Hudson 1, an offset, was completed for 250 barrels daily through choke.

Lexington Area: Amerada tested salt water at Carpenter 1, wildcat in SW NE NW 17-6n-1e, about 7 miles east of Lexington. Casing was perforated at intervals between 6436 and 6578 feet in Viola lime but production test recovered mud and salt water. Hole was being plugged back to test basal Hunton, logged at 5865 feet.

West Edmond: In the Kingfisher County sector, The Atlantic Refining Company appears to have a second gasser on its Trindle lease. Trindle 6, CSW NE 25-15n-5w, showed an estimated 5 million cubic feet of gas on drill stem test in the Bartlesville sand at 6609-22 feet, total depth. Previously Atlantic tested gas and gas-cut mud in Trindle 1, CSE SE 25-15n-5w, and was reported drilling below 7000 feet.

Gulf Oil Corporation finaled Wright 4, CSE NW 17-14n-4w, Oklahoma County, flowing 112 barrels of oil in 4 hours from Bois D'Arc at 6820-32 feet. Sohio Petroleum Company's King 4-A, tested 330 barrels of oil in 4 hours through perforations in Bois d'Arc at 6596-6666 feet and was being acidized.

East Pauls Valley: Oil was discovered on the flanks of the East Pauls Valley gas pool a year ago this month and the field has witnessed an energetic and orderly development with 46 producers listed and 10 wells drilling or in final testing stages. The pool has an allowable of 400 barrels per day with Ohio Oil Company, which developed flank oil production, the most active operator in the area.

Kansas

Rush Wildcat Flows 120 Barrels of Oil an Hour

Rush County wildcat flows 120 barrels of oil in hour; test near Pawnee Rock East flows 250 barrels of oil daily; Graham County wildcats claim attention; Carmi pool well tests dry in 6 zones; bad weather slows Kansas operations.

Barton County: Solar Oil Company's Behrens 1, SW NE 6-20s-15w, potential pool opener north of the Pawnee Rock East pool, continues to live up to expectations. With casing perforated opposite Arbuckle lime at 3729-33 feet and after acidizing with 500 gallons the wildcat flowed natural at the rate of 250 barrels of oil per day. During

Wells Completed in United States in Week Ended February 24, 1945

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	Cumulative This Year	Cumulative Last Year
Alabama	....	....	....	....	....	....	....	....	....	....	....	....	3	2
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Arkansas	1	....	....	....	1	....	....	....	2	2	3	2	22	24
California	30	1	....	....	31	....	....	....	3	3	34	33	296	251
Colorado	....	....	....	....	....	....	....	....	....	....	....	....	5	3
Florida	....	....	....	....	....	....	....	....	....	....	....	....	1	....
Georgia	....	....	....	....	....	....	....	....	....	....	....	1	2	1
Illinois	10	....	....	4	14	3	....	....	5	5	22	52	315	228
Indiana	1	....	....	2	3	....	....	....	1	1	4	4	41	45
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	1	2
Kansas	9	....	....	5	14	2	....	....	5	5	21	29	210	280
Kentucky	5	....	....	2	7	1	....	....	1	1	9	6	78	94
Louisiana	9	....	....	1	10	....	2	....	3	5	15	10	137	85
North Louisiana	1	....	....	....	1	....	1	....	2	3	4	3	50	26
South Louisiana	8	....	....	1	9	....	1	....	1	2	11	7	87	59
Michigan	....	....	....	....	....	....	....	....	....	....	....	20	96	89
Mississippi	2	....	....	....	2	....	....	....	3	3	5	4	51	12
Missouri	....	....	....	....	....	....	....	....	....	....	....	....	6	3
Montana	....	....	....	....	....	....	....	....	....	....	....	4	22	38
Nebraska	....	....	....	....	....	....	....	....	....	....	....	1	1	6
New Mexico	5	....	....	....	5	....	....	....	1	1	6	6	74	56
New York	15	....	10	....	25	....	....	....	....	....	25	25	137	172
Ohio	2	3	....	....	5	....	....	....	....	....	5	8	82	123
Oklahoma	26	....	2	7	35	2	2	....	4	6	43	48	348	217
Pennsylvania	27	3	15	....	45	....	....	....	....	....	45	44	335	394
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	....	3
Texas	97	12	....	21	130	1	5	2	29	36	167	98	979	717
E.Tex.Bor. Co.'s	....	1	....	....	1	....	....	....	3	3	4	3	9	3
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	....	1
Rest of E. Texas	1	....	....	....	1	....	....	....	....	....	1	4	32	38
North Texas	10	....	....	4	14	....	2	....	8	10	24	26	227	153
W. Central Tex.	....	....	....	1	1	....	....	....	....	....	1	9	44	56
West Texas	63	....	....	6	69	1	....	....	9	9	79	4	249	187
Tex. Panhandle	2	9	....	....	11	....	....	....	....	....	11	6	91	24
G. Coast, Upper	5	....	....	5	10	....	1	1	3	5	15	15	100	68
G. Coast, Lower	11	....	....	3	14	....	1	1	3	5	19	21	150	129
Southwest Texas	5	2	....	2	9	....	1	....	2	3	12	8	39	48
S. Central Texas	....	....	....	....	....	....	....	....	1	1	1	2	8	10
West Virginia	....	10	....	2	12	....	....	....	....	....	12	23	106	140
Wyoming	....	....	....	....	....	....	....	....	....	....	....	7	20	20
Total U. S.	239	29	27	44	339	9	9	2	57	68	416	425	3,368	3,006

* Includes distillate wells. † Includes salt water disposal wells.

previous tests on swab the well made about 10 barrels of oil an hour.

Rush County: Inland Oil Company's Peterson 1, SE SE SW 35-19s-16w, about 2½ miles northwest of the Pawnee Rock pool, flowed 120 barrels of oil in an hour before being shut in for storage. Production is from Arbuckle lime, which was acidized after casing perforations opposite 3725-27 feet. This play ties into Solar Oil Company's Behrens well strike in Barton County and has started a strong lease and royalty campaign along the trend.

Graham County: Two wildcats northwest and southwest of the Morel pool are claiming attention with both wells reporting good oil shows from Lansing and Simpson zones. Winkler-Koch's Faulkner 1, SW SE SE 27-10s-22w, swabbed 10 barrels of oil per day from Simpson sand through casing perforations between 3884-92 feet. Previous test through perforations at 3956-63 feet showed salt water. Six miles northwest of Morel, Helmerich & Payne, Inc.'s Luck 1, NEC 13-8s-22w, a wildcat surrounded by dry holes, swabbed 30 barrels of oil in one hour from Lansing lime at 3414-38 feet after acidizing with 1000 gallons. Testing continues.

Pratt County: The Carmi pool suffered a setback when Bishop Oil Company abandoned Knop 1, SW SW SE 21-26s-12w, after 6 nonproductive tests in the Lansing, Simpson and Arbuckle zones between 3660 and 4310 feet.

Stafford County: Good oil show in Lansing lime was reported at Republic Natural Gas Company's Asher 1, NW NW NE 1-24s-13w. With Lansing topped at 3467 feet a core at 3620-24 feet was stained and saturated. The wildcat, about 3 miles east of St. John, was drilling below 3740 feet. In the new Sand Hill pool, Magnolia Petroleum Company's Miller 1, SW SE SE 24-21s-12w, established a physical potential of 107 barrels of oil and 30 barrels of water from the Arbuckle zone. Mid-States Oil Corporation was rigging up standard tools to test Arbuckle lime topped at 3588 feet in Walter 1, SW SW SW 20-21s-12w.

Barber County: J. M. Huber continues testing Buck 2, NE SW NE 35-30s-14w, west of the Marjorie pool. Oil shows were logged at 4421-30 feet and the hole was carried to 4468 feet before testing operations began through casing perforations.

Nebraska

Scotts Bluff County: Fuerst Oil & Development Company's Dorsch 1, wildcat in the NW NW NW 6-20n-54w, near Gering in western Nebraska, was fishing at 4730 feet. The formation was logged as shale.

New Mexico

Lea County Semi-Wildcat Is Showing for Discovery

Eastern Lea County semi-wildcat is showing for discovery in Lower Clear Fork, while wildcat near west border of county makes oil flow from the Queen sand; Turner sector of the South Lovington area expanded ½ mile west.

Lea County: Gulf Oil Corporation's State-Andrews 1, C NW SE 32-22s-38e, 1⅝ miles southeast of the company's Penrose Deep field discovery in Clear Fork at 6375-6430 feet, missed this horizon but uncovered a deeper and probably more prolific horizon in the Lower Clear Fork. This prospect used tester at 6717-6864 feet, resulting in a flow of gas within 3 minutes and recovered 60 feet of 50.7-gravity oil with flowing bottom-hole pressure calculated at 1625 pounds. Additional pay was logged in coring to 6888 feet, where a drill-stem test with packer at 6714 feet yielded gas in 2 minutes with the flow reaching a maximum of 6,500,000 feet daily along with spray of oil throughout the test. It will be drilled through the zone before running pipe to complete through perforations. Gulf Oil Corporation's Gutman 1, north offset to its completed Clear Fork strike, landed pipe near bottom after drilling to 7010 feet without making a drill-stem test of the 6400-foot zone or the lower horizon. Four additional tests are under way with the Clear Fork as their objective.

Skelly Oil Company's Steeler 2, first Lower Permian exploration for the Skelly field and 6 miles southwest of the Penrose Deep strike, was coring dry dolomite at 6340 feet, having temporarily passed up promising shows in the 5100, 5400 and 6100-foot zones.

E. J. McCurdy and McElroy Ranch Company's State-Young 1, C NE NW 20-18s-32e, 2¾ miles south by west of the Maljamar field and 2½ miles west of the Cheesman pool, confirmed earlier indications of making a well in flowing 83 barrels of oil in 16 hours after drilling plugs from 5½-inch casing at 3650 feet with the hole bottomed at 3783 feet. Production is from the Queen sand, topped at 3737 feet with elevation of 3747 feet, being the equivalent of the upper pay in the Maljamar area.

Extension: The Texas Company's State 1-A-J, C NW NW 7-17s-36e, expanded the Turner sector of the South Lovington field ½ mile west with flowing potential of 332 barrels, gas-oil ratio 450/1, on open tubing test after using 4000 gallons of acid in San Andres broken pay at 4760-5160 feet. The upper pay zone was not as effective as in the field proper. This is the third consecutive ½ mile extension given the area by the company, and intermediate locations are being drilled, while the El Paso Natural Gas Company is starting State-Ramsco 1, C SW SW 36-16s-35e, 1⅜ miles northwest on 1000 acres purchased out of a 2000-acre block held by Tobe Foster et al.

Wildcats: The Texas Company's Eaves 1, 11 miles northeast of the Hobbs field, resumed coring at 5590 feet, having no effective showings since the 5300-foot level.

Phillips Petroleum Company's State-Lea-Mex 4, north of the east portion of the Maljamar field and currently the deepest active test in the state, was drilling lime and shale at 10,060 feet.

Magnolia Makes Transfers

Martin V. C. Bradley, district superintendent for Magnolia Petroleum Company, has been moved from Bay City to Houston, where he is superintendent of the newly created Gulf Coast producing division, embracing the Alice, Vanderbilt, Luling and Lake Charles areas. R. T. German, division superintendent at Dallas headquarters, has been transferred to Midland to take charge of the West Texas division, which includes all of the Permian Basin fields in West Texas and New Mexico as well as the Texas Panhandle and the Electra portion of North Texas.

West Texas

Andrews County Has Five Prospective Oil Strikes

Andrews County has 5 prospective oil strikes in the Clear Fork and Devonian, including 1 in process of completion; Pecos deep test is plugged after showing small volume of gas; Todd field due for northeast extension producer in Ellenburger.

Andrews County: Sun Oil Company's Martin 1, C SE SE PSL 17, Block A-41, is the third prospective strike along a north-south trend between the Fullerton and Embar fields, having recovered 30 feet of free oil along with water cushion and rotary fluid when tester was used at 6787-6962 feet. Effective saturation was logged at 6790-6800 feet and fair stain and porosity at 6800-10 and 6820-6962 feet, involving conditions similar to the Fullerton field. This projected Ellenburger test entered the Clear Fork at 5590 feet, being 724 feet high to Magnolia Petroleum Company's Martin 1, situated 6½ miles north by east. The latter failed to indicate production in the Clear Fork, but logged adequate effective saturation in the Devonian at 8727-87 feet to assure production if more attractive pay is not encountered in exploring the Ellenburger.

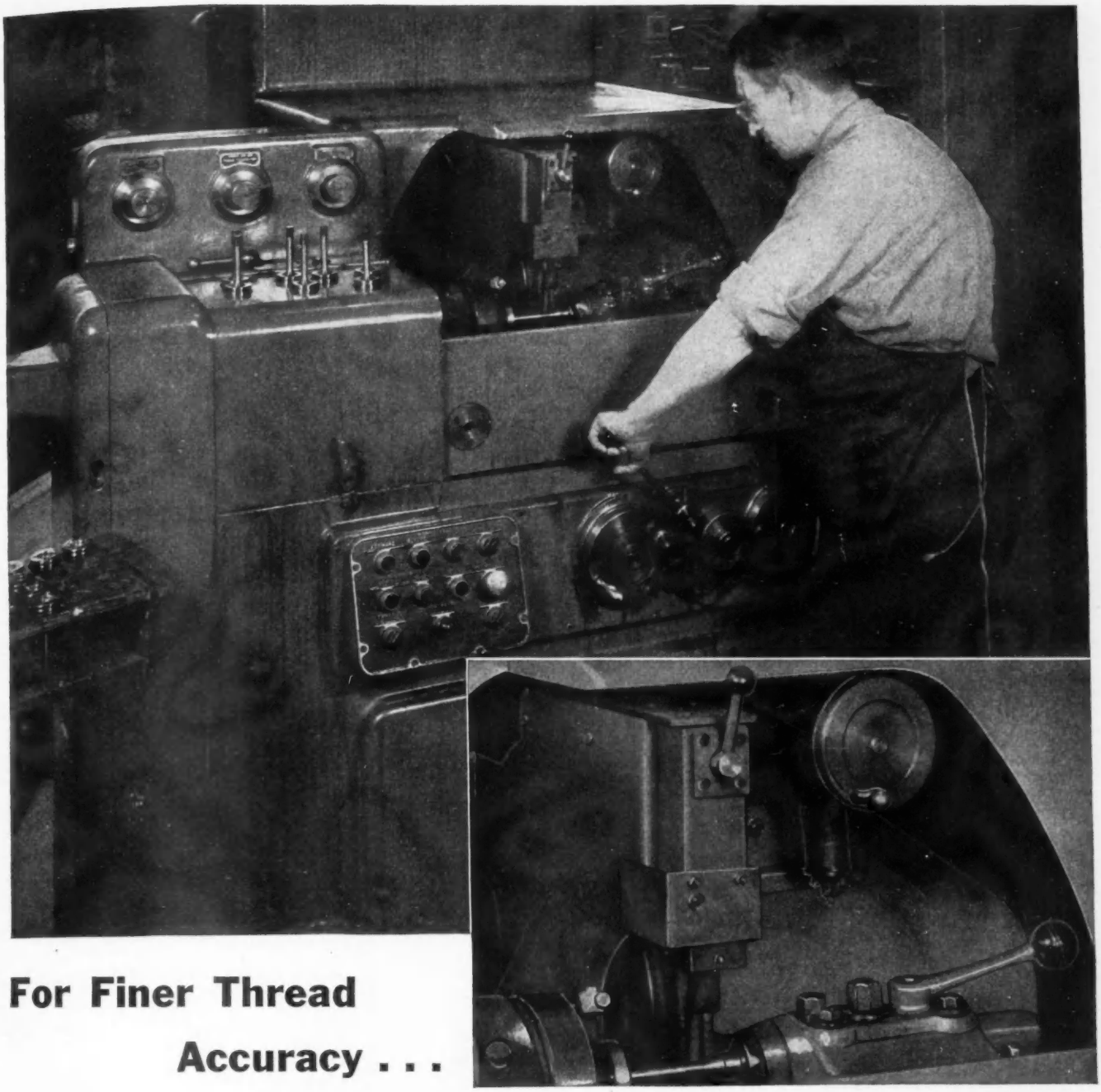
Stanolind Oil & Gas Company's University 1-P, C NE NE PSL 44, Block 13, about midway along the 5-mile interval separating the Fullerton-Devonian wells and the Magnolia Petroleum Company's prospect, is credited with having indicated production on drill-stem tests below 7800 feet, and was drilling below 8300 feet. University1-P is 3 miles south by east of Devonian production, and due to its favorable structural position a record-price cash bonus of $450,000 was paid at the February 16 University Lands auction by Phillips Petroleum Company for the south 321.8 acres of sec. 31, Block 13. This company also paid $205,000 for the SW¼ sec. 41, Block 13, and a similar bonus was paid by Gulf Oil Corporation for the NE¼ sec. 42, while Sinclair Prairie Oil Company was awarded lease on N½ sec. 41, for a bonus of $290,000.

Stanolind Oil & Gas Company's University 1-D, 3½ miles west of the West Andrews field and on a separate geological trend, flowed 18 barrels of oil hourly with subnormal gas volume after using 8500 gallons of acid in 3 stages through Devonian perforations at 8300-50 feet. A heavier acid injection was scheduled, then higher perforations will follow as the top of the pay is listed at 8037 feet. This wildcat failed to produce in Sulurian, which indicated production in drilling to water in Ellenburger at 10,466 feet. The company paid a cash bonus of $900,000 for its supporting block of 4026 acres.

Shell Oil Company and Texas Company's Ratliff 1, 5 miles west by north of University 1-D, was drilling shale and lime 8395 feet on Ellenburger objective after passing up flowing production in the 7800-foot zone.

Magnolia Petroleum Company's Ralph 1-A, west outpost for the Fullerton field and a failure in the Devonian, topped at 8114 feet, was drilling lime and shale 10,448 feet to explore the Ellenburger.

Pecos County: Phillips Petroleum



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Write for Bulletin No. E-93

LANDIS MACHINE COMPANY, WAYNESBORO, PENNA, U.S.A.

THREAD CUNTTIG MACHINES • DIE HEADS • COLLAPSIBLE TAPS • THREAD GRINDERS

Company's Price 1, wildcat that temporarily held the depth record in drilling to Ellenburger at 15,279 feet, will be plugged after testing a small volume of gas from perforations at 11,450-11,550 feet followed by nitro shot in pipe at 11,480-11,580 feet. Pipe was cemented at 15,278 feet then perforated opposite the Ellenburger with negative results.

Crockett County: Francis A. Callery et al's Shannon 1, C SW SW GC&SF Ry. 27, Block WX, and ¾-mile northeast of Crinoidal production, occupies the highest structural position in the Todd area, and will probably be the first completion in the Ellenburger, topped at 5925 feet with elevation of 2610 feet. Several promising oil zones were logged in drilling to 6304 feet, but the regular Crinoidal pay zone was almost absent. Pipe cemented at 6300 feet.

Amerada Petroleum Corporation et al's Todd 7-A, between the above test and production, also encountered a sharp rise in structure, having entered the Crinoidal at 5779 feet, barren Simpson at 5928 feet and Ellenburger at 6064 feet with elevation of 2622 feet. Pipe was cemented at 6340 feet, 10 feet off bottom, and will be perforated opposite oil saturation at 5786-5910 feet.

Deep Prospects: Stanolind Oil & Gas Company's Slaughter 1, Cochran County, was drilling black lime and shale at 9833 feet with no shows to this level. Magnolia Petroleum Company's Johnson 1, Lubbock County, was abandoned in granite at 10,178 feet, having only 105 feet of Ellenburger, topped at 10,066 feet.

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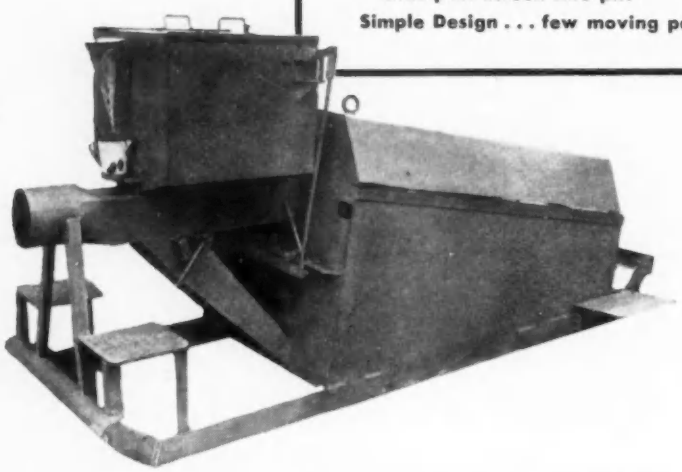

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ODESSA, TEXAS

North Texas

Prospect in Jack County Shows for Oil Producer

Jack County deep prospect showing for an oil producer; southwest extension due for Madden pool, Wichita County, in the Strawn series; Young County area records first Mississippian production.

Jack County: Panhandle Refining Company's Cherryhomes-Continental 1, R. S. Gorder survey and 1⅝ miles northeast of the Worsham-Steed pool, was due to take another core and set pipe after recovering 200 feet of oil and 400 feet of heavily oil-cut mud when tester was used in sand at 5034-52 feet. This prospect is ⅞-mile east by north of a 5252-foot failure that showed oil. Top of the bend was entered at 4804 feet with elevation of 1221 feet by the new test, and production is in Basal bend, or Marble Falls. The Worsham-Steed pool's 3 well produce from stray sand in the Smithwick. Panhandle Refining Company is starting a southeast offset.

James Stewart & Company's Kinder 1-D, 2 miles east of the Sewell field, flowed 90 barrels of oil on 12-hour gauge through ¼-inch choke after using mud acid to flush Marble Falls perforations at 4204-25 feet, having failed to make a producer in the Mississippian at 4542-4652 feet.

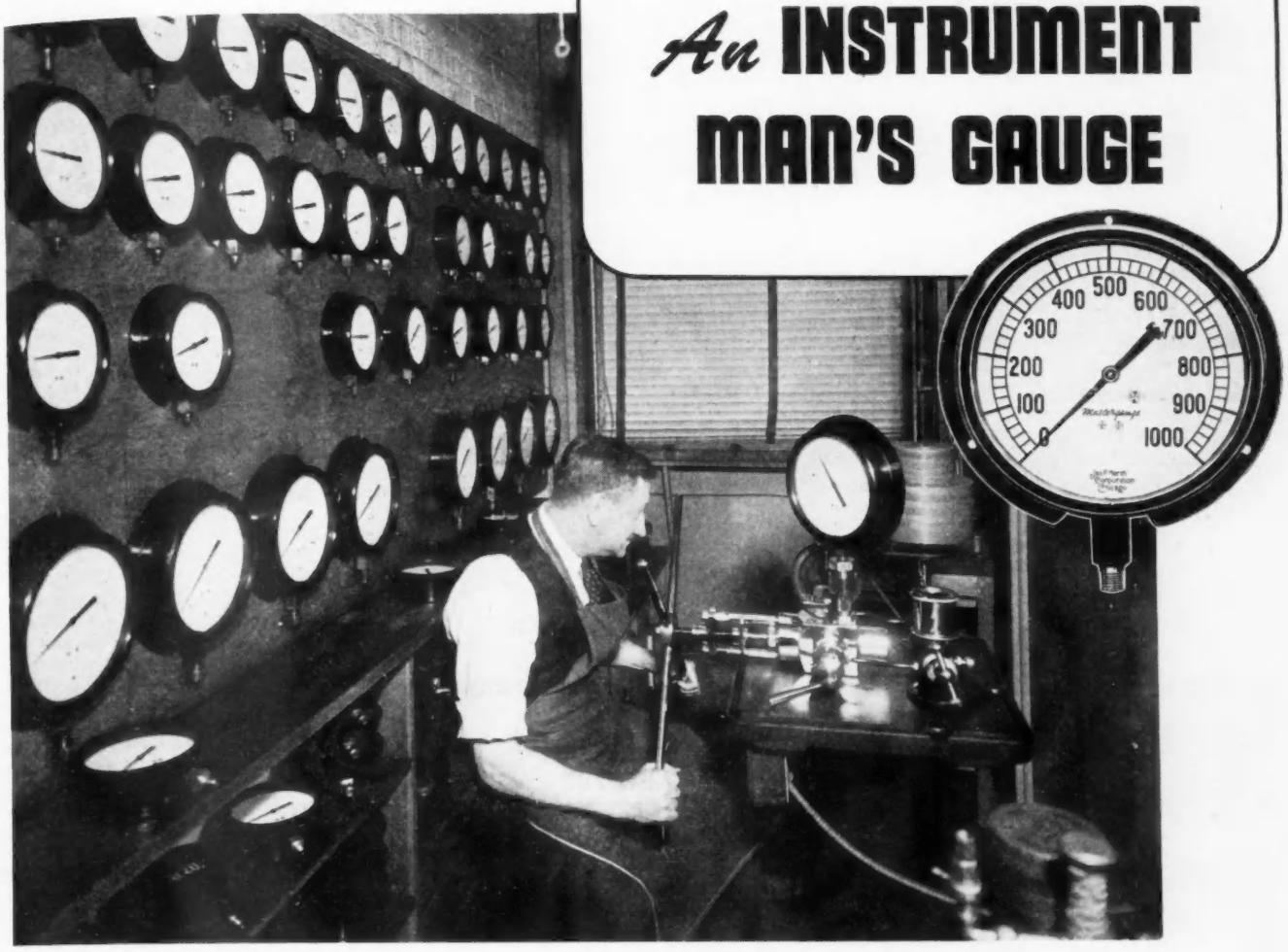
Wichita County: Consolidated Oil Company's Jones & Payne 1, BBB&C Ry. survey and ½ mile southwest of the Madden two-pay area, entered the K-M-A lime at 4123 feet, then drilled oil sand at 4415-20 feet, while 18 feet of oil sand was recovered in coring to 4438 feet. A drill-stem test was pending.

Young County: Standard Oil Company of Ohio's Garvey-Garr 2, sec. 1, BBB&C Ry. survey, and east offset to Bend production, was completed with potential of 465 barrels of 45.9-gravity oil, plus 7 percent water, on natural flow through ½-inch from Mississippian perforations at 5186-5216 feet. Top of Mississippian was logged at 5162 feet, or 61 feet low to the company's Garvey 1-C sec. 1802 and 2 1/3 miles west. The latter may make a small producer after acidizing through perforations at 5170-5200 feet, having plugged back from Ellenburger at 5275-5415 feet.

Clay County: Anderson-Prichard Oil Corporation's Wood 1-B, east offset to its discovery on the southwest flank of the Petrolia uplift, flowed 136 barrels of oil natural on 11-hour test of Bend perforations at 5967-96 feet, having plugged back from 6270 feet. The Bend was entered at 5876 feet, or 6 feet high, but the oil zone is lower in this confirmation well.

Wilbarger County: Production from several horizons below the Canyon and Strawn is in prospect for the Harrold field Big Six Oil Company's Schlaffke-Morris 1-A, on the northwest edge of shallow production, is making a pumper for Mississippian perforations at 4830-48 feet. G. E. Kadane & Sons' Kelly 1-B, NWC H&TC Ry. 34, Block 13, and on southeast edge of production, has set pipe after drilling Ellenburger at 5386-5904 feet to complete through perforations. Oil shows were logged in Canyon, Bend and Simpson, although it is considerably lower structurally than the other deep prospect.

An INSTRUMENT MAN'S GAUGE



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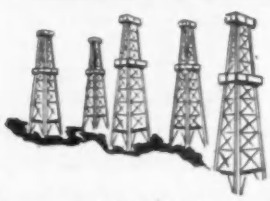

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East Texas

Freestone Well Shows Improved Production

Travis Peak discovery in Freestone County shows greater gas-distillate output after tapping upper pay zone; Falls County wildcat in Smackover will run pipe; two deep prospects in Henderson County at showdown level.

Freestone County: The Texas Company's McKnight 1, recent discovery in the Fairfield area, tested 3,000,000 cubic feet of gas daily with 34 barrels of 60-gravity distillate per million feet of gas through choke from perforations at 8232-47 feet in Travis Peak, topped at 7985 feet. The well previously tested 1,750,000 feet of gas daily with 25 barrels of distillate per million feet of gas through 10/64-inch choke from perforations at 8275-97 feet in the middle porous zone, but this was temporarily excluded by setting plug at 8260 feet. Closed in pressure is 3000 pounds. Lone Star Gas Company will provide a market for the gas, thus paving the way for more development.

Falls County: H. C. Cockburn et al's Cockburn-Gilliam 1, D. Barclay survey, entered the Buckner at 6735 feet and Smackover lime at 7134 feet with elevation of 408 feet. The test is bottomed in hard lime at 7328 feet. Pipe is scheduled to be set for a production test of 20-foot zone of white lime in top of the Smackover and also for possible gas in the Cotton Valley.

Henderson County: The Texas Company's Morse 1, Chandler prospect, entered the Pettit at 10,138 feet and Travis Peak at 10,302 feet, but had not encountered adequate porosity to warrant a drill stem test in coring to 10,380 feet. Gulf Oil Corporation's Frizzell 1, Baxter area, was coring dry lime without shows at 11,475 feet, having logged the massive anhydrite at 10,815 to 10,385 feet. Humble Oil & Refining Company's Jones-Huddleston 1, 2 miles southwest of Eustace, proved dry in Paluxy, topped at 5863 feet and was drilling to 7055 feet in upper Glen Rose, topped at 6110 feet.

Cherokee County: Humble's New Birmingham 1, Travis Peak project for the Rusk pool, entered the massive anhydrite at 8690 feet and was coring for top of Rodessa at 8770 feet. Humble's Stanley 1, Larissa area, failed to make a commercial well in flowing a small volume of oil with brackish water from perforations at 9570-9600 feet and will perforate the 8500-foot upper Glen Rose, where it made its best oil showing in drilling to Travis Peak at 10,737 feet.

Hopkins County: Humble's W. A. Nichols 1, Antonio Lazarin survey, recorded a northeast extension and the third producer for the Pickton field, in flowing 460 barrels of 50-gravity oil with gas-oil ratio of 1280/1 through ¼-inch choke from Bacon (Upper Rodessa) perforations at 7895-7905 feet.

Texas New Wells

Permits for drilling 156 new wells in Texas were approved by the Railroad Commission last week. There were 46 in North Texas, 41 in West Texas, 30 in Southwest Texas, 18 in West Central Texas, 8 in the Gulf Coast, 8 in East Central Texas and 5 in the Panhandle.

South Central Texas

LaSalle Test Abandoned As Dry at 15,301 Feet

The deepest well in the area was abandoned as dry at 15,301 feet when Quintana Petroleum Corporation's South Texas Syndicate D-3 LaSalle County, stopped operations at that depth without finding any showings of oil or gas.

At the time drilling was halted this was the deepest well in Texas, having gone just 22 feet deeper than the Phillips Petroleum Company well in Pecos County, but during the past week, another Phillips well in the Texas Upper Gulf Coast has gone still deeper. However, as far as is now known it still holds the record for the amount of open hole carried. It has 13,800 feet of open hole below surface pipe, and never was halted by a bad fishing job. The deep drilling operations were carried on with a 1500-foot string of 9⅝-inch surface pipe as all the casing in the hole.

Quintana has made location for its South Texas Syndicate F-1 as another wildcat in LaSalle County, 15 miles south of Fowlerton and contracted to 8000 feet.

Edwards County: Dan Auld has made location for Sid Peterson Heirs 1, wildcat 15 miles north of Rock Springs on a 12,600-acre lease. It is being drilled as a 5500-foot Ordovician lime test and is supported by several major companies.

Southwest Texas

Potential Test Run on Duval County Discovery

Potential test is run on Duval County discovery; outpost location made in Starr County field.

Duval County: M. M. Miller & Son's George Herberger 1, new discovery east of the Longhorn field, has taken 24-hour potential test, flowing 72 barrels of pipe line 45.2-gravity oil through a 9/64-inch choke with tubing pressure 260 pounds and casing pressure 1120 pounds. Total depth is 5948 feet, 7-inch casing at 5890 feet, and casing perforated with 19 shots at 5840-45½ feet.

The same operators have made location for the next test in the area, Miller Fee B-1, which will be in Block 33, Santa Flores Grant, and 1900 feet southwest of the Herberger 1 discovery well. It is contracted to 5900 feet.

Starr County: W. H. Holland has made location for his Sugarland Industries 1, a 4200-foot test on a 100-acre lease and situated 2000 feet northeasterly from Goldston's Sugarland C-2, nearest production in the Boyle field.

In the Ross field, Sun Oil Company has made plans to rework Frost National Bank B-1, originally abandoned at 3808 feet. It will be cleaned out for a production test.

Texas Field Named

The Advisory Board of the Houston Geological Society, acting as the nomenclature committee, has given the name "Metzke" to the Wharton County, Texas, field, discovered in December, 1944, by The Texas Company.

"THE DERELICT" — By E. M. Schiwetz

LIKE a gaunt specter the abandoned derrick stands—a casualty of the reckless days of hit-or-miss methods and boom-towns.

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Lower Texas Coast

Karnes County May Have Gas-Distillate Discovery

Karnes County likely to have new gas-distillate discovery; another wildcat testing for production, Bee County wildcat preparing to test, should open new oil field.

Karnes County: Seaboard Oil Company's Sallye Treadwell 1, wildcat 2 miles southeast of Coy City, has opened a new gas-distillate field from the Wilcox zone, flowing on initial gauge at the rate of 62 barrels of condensate daily along with considerable gas, ratio being 11,000 to 1. Flow was through a ⅛-inch choke with tubing pressure 2300 pounds and casing pressure 2500 pounds. Previous tests showed gas and distillate at 6869-87 and at 7012-19 feet. Depth is 8055 feet.

Phillips Petroleum Company's Belknap 1, 7½ miles southwest of Kenedy, which last week indicated opening of a gas-distillate field when it tested 2½ barrels of distillate hourly at 7031-35 feet, is testing again after a squeeze job. It was re-perforated at 7031-35 feet and is showing more condensate and gas, not yet gauged. Total depth is 8033 feet.

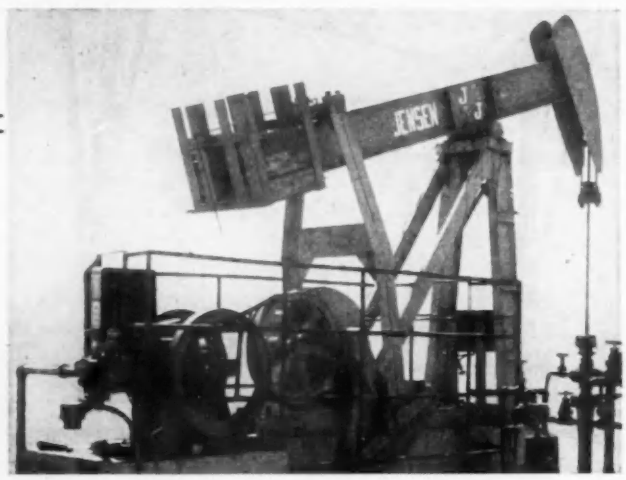
Superior Oil Company has abandoned Wilbern 1, 5 miles southwest of Nordheim, after drilling to 8575 feet in shale.

Bee County: Fred W. Shield and Allen & Morris were preparing to perforate at latest report in the J. L. Courtney 1 at Tulsita townsite. It had tested oil at several points, including 1300 feet of oil in 15 minutes from the Slick sand at 7042-48 feet, and drilled to contract depth of 7500 feet. The operators have made location for J. L. Courtney 2 in the same area, 1075 feet southwest of the discovery well. Navarro Oil Company has made location for a well to the south.

Brooks County: Shell Oil Company is making location for Cage Ranch 1, going to 11,000 feet.

Standard Oil Company of Texas has taken over Sun Oil Company's old Jacob Villareal 1, on an expired lease, and will deepen from 7508 feet, where it was abandoned. It is located 4½ miles southwest of Falfurrias.

It's a honey!



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Upper Texas Coast

Brazos County Test Now World's Second Deepest

Liberty County gets new oil field; Harris County field has ½-mile extension; testing continues in San Jacinto County discovery; Brazos County test now second deepest in world.

Liberty County: Shell Oil Company has opened what probably will be termed a new field in the northwest part of Liberty County, in completing its Grogan Manufacturing Company 1, in the Clayton Harper Survey. After drilling to 12,250 feet, for a test of the Wilcox section, it was plugged back to 5785 feet and casing was landed at 5788 feet. Perforations were made at 5782-84 feet, and on initial test it flowed at the rate of 294 barrels of 40.3-gravity crude daily through a ¼-inch choke with tubing pressure 1700 pounds and casing pressure 2200 pounds. The flow contained 5 percent water. This production is from the Cockfield sand producing in the Cleveland field, and though it is only a mile from Cleveland production, is separated from the field by dry holes.

Harris County: Tide Water Associated Oil Company's Ruth G. Cobb 1, 2000-foot west extension to the Satsuma field, is running potential test after being completed through perforations at 6822-26 feet. At latest report it was flowing at the rate of 15 barrels of pipe line oil per hour through a ¼-inch choke with tubing pressure 500 pounds and casing pressure 900 pounds.

San Jacinto County: Navarro Oil Company's Foster Lumber Company 1, discovery for a new area in western San Jacinto County, was still testing at latest report, having shown water on the latest test through perforations at 7906-10 feet. It had originally tested 4½ barrels of oil an hour along with considerable gas from 7905-10 feet and had been squeezed to try to shut off some of the gas. It is now standing after cementing again following the show of 35 percent water. It started out on latest attempt making 7½ barrels hourly, but water broke in.

Hardin County: Houston Oil Company & American Republics Corporation's Hardin Fee 2, wildcat south of the new Village Mills field, is drilling below 9448 feet, after having picked up a show of oil and gas at 9415-28 feet.

Brazos County: Phillips Petroleum Company's Fannie Schoeps 3, on the Millican dome, was drilling the latter part of the week below 15,477 feet, and is now the deepest hole drilled in Texas. It is 176 feet deeper than Quintana Petroleum Company's well which last week had set a new Texas record of 15,301 feet. The latter has been aban-

doned, but Phillips Petroleum Company's test is still drilling, making good time with no apparent intention of stopping. It was 198 feet deeper than the company's Price 1 in Pecos County, West Texas, and is the second deepest well in the world. It is using a heavy rig capable of drilling deep enough to set a new world record. It was spudded June 15, 1944, and has a string of 9⅝-inch protection pipe set at 9568 feet.

South Louisiana

Wilcox Field Indicated For Rapides Parish

New pay sands added in 2 fields; Wilcox field indicated in Rapides Parish; Shell sets what is believed to be a record string of 7-inch casing in a deep wildcat.

Jefferson Davis Parish: Barnsdall Oil Company et al, in completing Joseph Fuselier 3, have opened another sand for the West Tepetate field, this one producing gas from perforations at 9272-76 feet. Apparently the operators were in need of additional gas for fuel, since there are 2 other horizons above this which have produced oil in other wells, but which were not tested in the Fuselier 3. Total depth is 9312 feet, and squeeze jobs were made at 9264-68 feet and 9280-83 feet before perforating between for completion. The company now has 2 other wells actively drilling in the field and another rigging up.

St. Mary Parish: The Atlantic Refining Company has opened a new sand in the North Jeanerette field with its Teche Sugar Company 1, in 19-13s-9e, which was completed through perforations at 11,880-892 feet and flowed 76 barrels of 50.5-gravity condensate daily through 3/16-inch choke with tubing pressure 2100 pounds and gas-oil ratio 12,767 to 1. Depth is 12,992 feet with casing at 12,377 feet.

Iberia Parish: Shell Oil Company, Inc.'s, Smith-State Lse 500, Unit 1, wildcat in the Weeks Island area, is standing cemented after setting a string of 13,550 feet of 7-inch casing, believed to be the longest string of 7-inch ever set. Depth is 13,551 feet, where the well had been carrying around 11,000 feet of open hole. It will drill on to about 14,000 feet.

Rapides Parish: Louisiana Land & Exploration Company has indicated possible opening of Wilcox production in Rapides Parish with a test in J. A. Bentley, Jr., A-2, which has drilled to 7220 feet and set 5½-inch casing at 6600 feet. It was perforated at 6495-6505 feet in Wilcox sand and on a drill stem test flowed at a rate of 200 barrels daily through a ¼-inch choke, 75 percent of the fluid being 38-gravity oil with the rest salt water. It has squeezed and will re-perforate for another test in the same sand. The new area is in the extreme northwestern corner of Rapides Parish, south of Flatwood, and about 27 miles northwesterly from Alexandria.

Acadia Parish: Humble Oil & Refining Company has completed M. L. Vincent, Jr., 3, North Tepetate area. It flowed 6.54 barrels hourly through ⅛-inch choke from perforations at 7846-48 feet. Tubing pressure is 1150 pounds, gravity of oil 37 degrees.

Texas Oil Facts

The Texas Mid-Continent Oil & Gas Association, 907 Continental Building, Dallas 1, has issued a booklet, "Important Facts About Texas Oil," in celebration of the 25th anniversary of the founding of the association.

The booklet contains 64 pages of factual information and historical data on the Texas Petroleum industry, and is among the most complete and authoritative brochures ever compiled concerning the state's petroleum industry.

Copies may be had by writing the association in Dallas.

War Films Shown

Two war films were shown February 19 at the weekly luncheon meeting of the Engineers Club of Tulsa. The films were entitled "For Distinguished Service" and showed the uses to which 100-octane fuels are put in actual combat duty, and "Invasion, Nazi Version," a captured German film.

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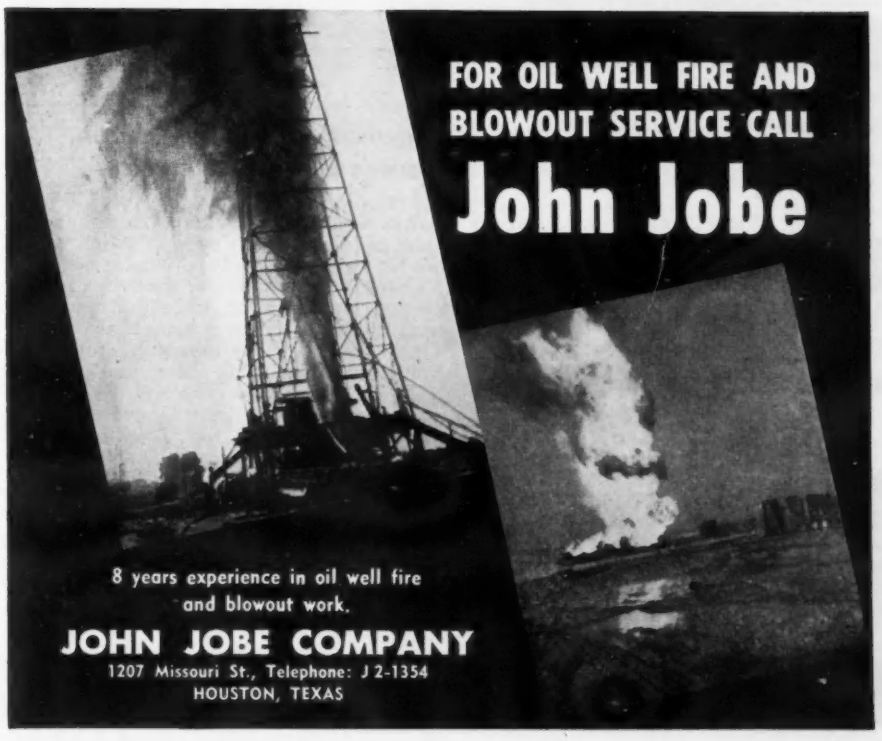
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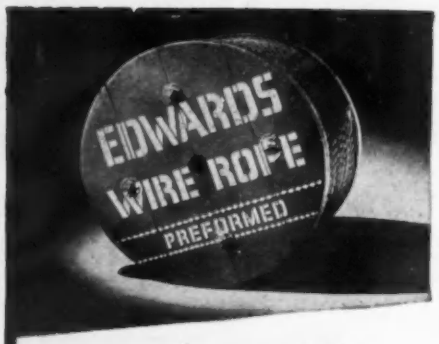

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North Louisiana

Wildcat in Natchitoches Parish Is Abandoned

Wildcat abandonment offsets 2 tests in De Soto and Caddo Parishes; new localitions listed for Holly, Lake St. John, Háynesville, and Delhi fields.

Natchitoches Parish: The California Company's one-promising wildcat, Annie Morrison 1, 12-13n-8w, has been temporarily abandoned, after perforations from 3295-3310 feet yielded salt water with oil diminishing to 5 percent. Perforations were in the Eagleford sand, which, with a showing in the Rodessa, were the most promising horizons tested.

Caldwell Parish: Shell Oil Company is below 11,595 feet in lime and shale in Louisiana Central Lumber Company 1, SW SW NW 31-15n-3e, deepest drilling well in North Louisiana, which has already indicated commercial gas or gas-distillate production.

Madison Parish: Sohio Petroleum Company's deep wildcat, H. Harper 1, 2-16n-13e, was abandoned at 6952 feet with no indication of oil or gas.

Caddo Parish: Phillips Petroleum Company is testing 80 barrels of oil per day through small-sized choke on tubing at Moneyham 1, C NE NW 5-18n-16w. This Travis Peak discovery well has a low gas volume and is testing to determine which choke size will give the best yield. Production is from 20 perforations at 5855-60 feet. It also logged showings of gas and distillate in 2 other zones of the Travis Peak. Depth is 6512 feet.

James M. Fergotson has taken out a permit for Cook 1, SE NE 10-19n-16w, Paluxy sand test, and will begin work immediately.

Webster Parish: Hunt Oil Company's O. G. Roberts 1, 11-23n-10w, second deepest test in the state, is drilling below 11,135 fet and should be in or near Smackover. The well logged a good showing of oil and gas in the Pettit from 5713-65 feet on a drill stem test.

Arkansas

Stephens Field Is Given James Lime Production

Activity revived with the discovery of James lime production in the Stephens field of Columbia County, which may double reserves in the Stephens field.

Columbia County: Stephens field, the most active area of the state, became even more important when R. H. Crow, Trustee, obtained production from the James lime in J. B. Morgan 1, NW NE NW 18-15s-19w. The well was originally completed August 11, pumping 15 barrels daily from the Buckrange at 2178-92 feet, after testing salt water from the Travis Peak. Crow went back into the hole and reperforated opposite the James from 3086-3150 feet. The well swabbed 100 barrels of oil and 10 percent basic sediment and water on initial test. Pumping unit was being erected to continue testing.

The entire southwestern sector of Arkansas is now open to possible James production. Operators in various fields are studying electrical surveys and correlating with a view to retesting this horizon. Other producers in the Stephens field are producing from this interval in the Glen Rose but not in the James lime.

Crow, Trustee, also completed Smart C-2, SE NE SW 12-15s-20w, pumping 175 barrels of oil and 501 barrels of salt water per day through 60 perforations at 3406-25 feet. Depth is 4100 feet, with 5½-inch casing cemented at 4020 feet.

Tide Water Associated Oil Company is preparing to move in material for Pearce 2, C SW SE 3-18s-20w, Calhoun field. The field has only 3 producers and this test should indicate further the limits of the field. The week's other location was made in the Rainbow field of Union County, where C. G. Mears staked location for Gaddy 1, NE NW NE 14-17s-14w.

Union County: E. G. Bradham will take over and rework The Atlantic Refining Company's Murphy Land Company 1, C NW SW 2-18s-18w, which opened the Wilks field in February, 1944. Its initial production was 85 barrels of oil and 113 barrels of salt water daily, through ¼-inch choke on tubing from perforations opopsite the Smackover at 7861-63 feet. The well has been dead 4 months.

Bradham obtained the well plus additional acreage on a farmout from Atlantic and will attempt to recomplete in the Smackover lime, of which there are 30 feet above the water level.

C. H. Murphy, Jr.'s C. H. Murphy 1, 4-19s-15w, is drilling at 4685 feet.

Miller County: Atlantic was drilling at 9862 feet in Eagle Mills with no indications of production in Montana Realty Company 1, C SW SE 17-17s-28w. The well entered Eagle Mills from the Smackover at 9745 feet, by samples and drilling time, and probably will be carried to the salt.

The Arkansas Oil & Gas Commission has amended spacing rules affecting the Atlanta and Village fields of Columbia County, the Buckner field of Columbia and Lafayette Counties, and the Patton field of Lafayette County to provide that hereafter no well shall be drilled at any point more than 100 feet from the center of a governmental 40-acre drilling unit.

Map Shows Development

A map showing the extent of development and the structure of the principal producing sand in the Cole Creek oil field, Natrona and Converse Counties, Wyoming, was issued last week by the geological survey and a few copies have been made available for distribution at the Washington and Casper, Wyoming, offices.

The field was discovered in May, 1938, by General Petroleum Corporation, whose well produced from the sandstone members of the Cloverly formation between 7919 and 8012 feet. Two years later showings of oil noted in the Shannon during the course of drilling a well paved the way for much of the subsequent development, producing from depths of 4500 to 4600 feet. As of January 1, last, there were 38 wells, 29 producing from the Shannon, 6 from the Cloverly formation and 3 dry holes. Total production to the end of last year, it was said, was about 1,500,000 barrels of oil, average gravity 35.6 degrees from the Shannon, and about 300,000 barrels, average gravity 34.1 degrees, from the Cloverly.

Southeastern

Marion County, Mississippi Field Opened by Humble

Humble opens field in Marion County, Mississippi; preparations being made to test a well which may extend Heidelberg production more than 2 miles; casing set for test of showings in wildcat west of Tinsley field, Yazoo County.

Marion County: Humble Oil & Refining Company's A. Evans 1, 9 miles southeast of Columbia, has opened the company's first field discovery in Mississippi. During a 19-hour test through a 3/16-inch choke with casing perforated at 9126-28 feet in the Tuscaloosa sand, it flowed 77.9 barrels of 45.5-gravity oil along with gas estimated at 1,490,000 cubic feet daily. Tubing pressure is 2560 pounds and gas-oil ratio is 15,150/1. On a 12-hour preliminary test, it flowed at a rate of 9 barrels of oil daily through a 3/32-inch choke with gas-oil ratio around 40,000/1, through the same perforations. With continued testing the oil volume is increasing and gas-oil ratio is being reduced. Production is from a Tuscaloosa sand above the Massive section that carried salt water in this well. The new discovery is on the flank of the Lampton salt dome, and is 10 miles northwesterly from the new Baxterville field in Lamar County.

Jasper County: Sinclair-Wyoming Oil Company's Bethea 1, 2½ miles northwest of production in the Heidelberg field, is waiting on cement with casing cemented at 5086 feet after the well was drilled to 6522 feet. Preparations are being made to perforate in the Eutaw section, where a drill-stem test of sand at 5007-32 feet showed oil at the time it was cored.

Gulf Refining Company's Thornton 5 in the Heidelberg field has been completed from 5312-18 feet, making 90 barrels of 32.5-gravity oil in 20 hours through a 6/64-inch choke with tubing pressure 350 pounds. This well is producing the highest gravity crude yet found in the field.

Yazoo County: Southern Natural Gas Company's Gammil Investment Company 1, wildcat 9 miles west of the Tinsley field, is standing cemented with casing at 6900 feet, after having run electric log and taken side wall cores. It will test a showing of oil in the basal Eutaw at 6600 feet, and possibly an upper Tuscaloosa sand which had some showings on a test at 7461-71 feet. Total depth is 8003 feet.

Jefferson County: Tide Water Associated Oil Company has made location for B. F. Buie 1, Tuscaloosa wildcat on its Union Church block a mile east of the Union Church townsite.

Humble Oil & Refining Company's Smith 1, in the same county, is drilling below 3885 feet in the Wilcox after having made a drill stem test of possible shows in sand at 3655 feet, but it recovered 3500 feet of salt water.

Florida

Humble Oil & Refining Company made a drill-stem test in State 1, NE NW 30-55s-36e, Dade County, and recovered a 6500-foot water cushion with 290 feet of drilling mud in 1 hour and 55 minutes. The test was made at 11,414-26 feet, using ¼-inch and ⅜-inch chokes. It is drilling below 11,542 feet in lime.

Humble's Gulf Coast Realties 4, 20-48s-30e, Collier County, is drilling in hard lime at 7619 feet. Operator's G. S. Carleton 1, C SE NE 34-38s-29e, Highlands County, is also drilling lime at 2180 feet.

The Pure Oil Company's C. C. Hopkins 2, Gulf County, 21-6s-9e, is drilling below 4056 feet. In Monroe County, O. D. Robinson's State 1, W of NEc NW 29-59s-40e, is below 1600 feet. Florida's newest wildcat.

Georgia

Tropic Oil Company is reported to have logged broken sand which carried an odor of gas and a rainbow showing of oil on pits in Gibson 1, 4½ miles southwest of Lyons in Toombs County. Identity of the formation, from 2168-2261 feet, was not revealed.

Laurens County: Calaphor Oil Company is rigging up rotary tools and is due to spud in Mrs. Gracie McCain 1, 10 miles east of Dublin and ½ mile south of Minter. Whether dry or productive, this wildcat will reveal comparison with Sun Oil Compnay's Doster-Ladson 1, Land Lot 71, District 7, recently abandoned in Atkinson County 82 miles due south. It will also reveal the presence of fresh or salt water in the sands. Sun's failure had fresh water at 3262 and 3958 feet. A well drilled by Dixie Oil Company in 1923 near McRae in Wheeler County 35 miles southwest of McCain 1 logged salt water in the same sand that carried fresh water in Doster-Ladson 1.

Echols County: Hunt Oil Company has rigged up rotary tools and is drilling below 810 feet in Superior Pine Products Company 2, in the southwest corner of Land Lot 317, District 13.

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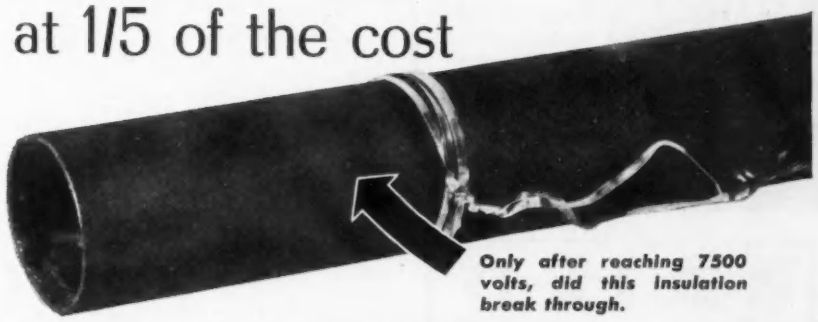

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TRADING POST SECTION

ON PAGE 91 OF THIS ISSUE

Because of the scarcity of certain types of new equipment and the fact that some operators may have a surplus of some items and a serious shortage of others, this **Used Equipment Forum** is performing a valuable service to operators in locating needed used materials or disposing of surpluses that may be needed by others.

Illinois Basin

Illinois Pool Is Opened Near Stokes Production

Pool opened in White County, Illinois; Macklin field extension flows 1800 barrels on test; Wayne County test shows for production; extension completed in Kentucky.

White County: H. Weinert has opened a new pool at Kisner 1, SW NE SE 31-5s-9e, White County, 2 miles north of the Stokes pool.

During a 1-hour drill stem test of McClosky lime, the well made 3000 feet of oil and then on a 50-minute test of Rosiclare at 3120-25 feet the well filled with oil. The McClosky was encountered at 3100-10 feet. The operator is drilling.

Wayne County: The Pure Oil Company's Ruble 1, SW SE SE 1-1n-7e, eastern extension of the old Macklin field, flowed 1800 barrels of oil during initial production test of McClosky lime. Depth of the well is 3020 feet.

Pure's Staley 1, SE SE NW 23-2n-7e, 1½ miles north of production in the Keith Township pool, showed for production in the Aux Vases and McClosky lime. Casing has been set for production test.

Gallatin County: Gulf Refining Company's Egli 1, SW SE NW 29-7s-10e, appeared dry although decision from an electric log test was awaited. The well was drilled to 3004 feet.

Jefferson County: E. J. Ruwaldt's Sherman 1, ME SW SE 6-3s-1e, is preparing to drill on wildcat farmout acreage from Magnolia Petroleum Company.

Kentucky

The Carter Oil Company has completed its Drury 3, 1-0-20, north extension of the St. Vincent's pool, Union county. During initial production test the well made 578 barrels of oil in 24 hours. Production was obtained from McClosky lime at 2556-63 feet after an acid treatment.

Michigan

Production Falls on Test Of Clinton County Well

Clinton County well to be deepened; no additional pay logged after Bay County test deepened; gas logged in Clare County wildcat.

Clinton County: Production dropped from a peak of 61 barrels to 2 barrels on a 14-day test and Smith Petroleum Company will deepen to the Dundee lime section on the Kellam 1, SW NE NE 33-8n-4w, Lebanon Township, wildcat. Zone under test in Traverse lime was logged at 2459-75 feet.

Bay County: Walton & Stewart's Agnor 1 wildcat, NE NE NW 27-18n-3e, Gibson Township, was shut down for orders at 3065 feet after deepening from a show at 2937 feet in the Dundee without logging additional pay. The show, reported up to 200 feet of oil, was lost after casing had been set and cemented at 2937 feet.

Clare County: The Pure Oil Company logged an estimated 5,000,000 cubic feet of gas in Stray sand at 1678-80 feet on Powell 1, n½ SW NW 7-18n-4w, a wildcat in Hatton Township. Gas pay probably will be cemented off and test carried to original 4000-foot objective.

Osceola County: Sun Oil Company's State B1, s½ NW NE 10-18n-8w, wildcat, logged Dundee dolomite at 3944 feet and picked up a good show of free oil and gas at 3945 feet for a potential pool opener. Test is three miles southeast of the Rose Lake pool.

California

Richfield Takes Leases In Santa Barbara County

Richfield locates Santa Barbara test; location staked for Los Angeles wildcat; Montebello field well recompleted; Del Valle field test completed.

Santa Barbara County: Richfield Oil Corporation has taken a large block west of Buellton, and is preparing to drill a test well. Covering an area in excess of 6000 acres, the leases extend approximately 6 miles west of Buellton and comprise a portion of the Rancho San Carlos y Junta and Rancho Santa Rosa. The proposed location is on the Eskild Skytt property near the south quarter corner of projected 33-7n-32w. The well will be a deep Miocene test and will be started as soon as drilling tools and crews are available.

Shell Oil Company, Covarubias 1-33, 32-5n-30w, was completed February 10, flowing 1374 barrels per day rate through a 32/64-inch bean then 222 barrels in 12 hours through a 16/64-inch bean with 920/780 pounds and 699,000 cubic feet gas rate. Production for February 11 was 529 barrels, 39-gravity oil cut oil through a 16/64-inch bean with 990/1000 pounds and 695,000 cubic feet of gas.

Union Oil Company is grading for Fugler 1, located 330 feet north and 330 feet east from the s¼ corner of 3-9n-33w. Location is ½-mile north of Santa Maria Realty 1, discovery well of this new area to be known as the Bradley Canyon field.

Union Oil Company's Wheat 1, 22-10-34, is rigging up to deepen to the Knoxville sandstone. Depth is 4181 feet. Top of Franciscan was placed at 4165 feet.

Fresno County: Seaboard Oil Company, 72-6, 6-15-17, was abandoned at 6455 feet. All sands were grey. Top of Kreyenhagen was placed at 5802 feet, Eocene at 6185 feet, Domengine 6212 feet, Cretaceous 6270 feet, and Wheatville sand 6409 feet. It was some 40 to 50 feet higher structurally than any other well in this area.

Los Angeles County: Standard Oil Company has staked location for Wigdal 1, a wildcat, 330 feet north and 330 feet east from the center of the sw¼ of 19-3n-16w, approximately 1½ miles west of the Aliso Canyon field.

Fullerton Oil Company, McGinley 28, Montebello field, is reported to have recently gun-perforated at an undisclosed interval and recompleted, flowing a considerable amount of clean oil. Estimates of production are running between 600 and 800 barrels per day. The well was originally drilled in 1934 to 7055 feet.

Barnsdall Oil Company, R.S.F 44, deep test of the Newhall Potrero field, has 7-inch casing standing cemented at 11,100 feet. Top of the seventh zone was placed at 10,300 feet. It is possible more hole will be made before testing.

R. E. Havenstrite, Operator, Liebhart

2 in the Del Valle field was completed February 9, flowing at an estimated 300-400 barrels per days rate, 58-gravity oil, cleaning through a 24/64-inch bean with 1400/1400 pounds pressure and considerable gas. Production is from gun-perforated interval at 7965-8020 feet.

The Texas Company has announced a location for Kern 1, wildcat test west of the Del Valle field, 2251 feet easterly along a north line from the northwest corner of 18-4n-17w, thence 991 feet southerly at right angles.

Sacramento County: The Superior Oil Company, Reclamation Board 2, 7-3n-3e, was completed February 6, flowing 3,096,000 cubic feet of gas through a ¼-inch bean, pressure of 2128/2120 pounds and through a ¾-inch bean, 22,465,000 cubic feet with pressures of 1987/1921 pounds.

Rocky Mountain Area

Drilling of 12,000-Foot Test in Wyoming Begins

Mountain Fuel Supply Company's Unit 1, NE SW NW 8-16n-112w, proposed deepest test in the Rocky Mountain area, Church Buttes area, Uinta County, southwestern Wyoming, has set surface pipe and is drilling to test the Frontier sands, due to be encountered at 12,000 feet. It is believed that the test will have good wildcat production possibilities in the Wasatch formation before the Frontier objective is reached.

A mile extension to the prolific Lost Soldier field appears proven as the Sharples Corporation is swab testing 520 barrels of 35-gravity oil per day from the Tensleep sand in Government 1, NW NE NW 14-26n-90w, south end of the field.

Bailey Dome: Second test of the newly discovered Bailey Dome pool is rigging up rotary on Sinclair's Milton Coffman 2, SE NW NE 21-26n-89w, Carbon County. The discovery flowed more than 400 barrels of 37-gravity oil from the Tensleep after drilling to 5234 feet and squeezing off bottom water to 5195 feet.

Half Moon: This pool has the second test waiting on cement after setting surface casing at 206 feet. This is Husky Refining Company's Morrison 2, NW NE SW 23-51n-102w, Park County. Production from the discovery is shut down for better road conditions to Husk Refinery at Cody.

Oil Mountain: The Texas Company is preparing to plug back Clark 1, C NE SW 35-33n-82w, Natroma County. Drilling stopped after finding the Madison and Deadwood dry at 3416 feet. Saturation was found in Tensleep cores from 2622-2795 feet and the hole will be plugged back to this zone for production tests.

Montana

Fox-Luther: The Carter Oil Company's Bowlen C-112 No. 1, C SW NE 14-6s-19e, Carbon County wildcat 10 miles west of the Dry Creek oil field, is drilling in Thermopolis shale at 8250 feet. No showings have been reported.

Devon Area: After completing a small discovery well in the Sunburst sand, 1382-1393 feet, pumping 15 barrels per day and a small amount of water after acidizing with 500 gallons, Texas is rigging up 40 acres west of the discovery to drill the C. Ekholt 2, in C N½ SE NW 3-33n-1e, Toole County.

WESTERN CANADA

Folding Mountain Wildcat In Objective Formation

Jasper Syndicate 1, wildcat on the Folding Mountain anticline in the Central Alberta Foothills, has reached the top of its objective formation, the Devonian Limestone, after penetrating 1200 feet of the hardest rock yet drilled in the province. The Devonian came in at 2978 feet. With bottom at 2984 feet, 7-inch casing has been set to 2979 feet preliminary to drilling in. The hard drilling came in from surface rock to the top of the Madison lime at 1207 feet, with only 4½ feet per bit being averaged through the overlying Triassic beds. Banff shale was entered at 2360 feet, the Exshaw at 2939 feet. Only shows to date have been small volumes of gas. In lsd 2 19-49-26w5th, the well is a joint venture of Imperial Oil, Ltd., Anglo Canadian Oil Company and Home Oil Company.

Phillips Petroleum Company has passed back from Madison Limestone into an inverted section of Fernie shale after drilling 48 feet of lime at its Sullivan Creek 1, lsd 3 22-18-5w5th. Lime was topped at 1932 feet, 10¾-inch casing set at 1956 feet.

The Duke of Windsor and Associates' Ecushwa Oils No. 1, lsd 15 25-16-3w5th, in the Pekisko Hills section of the Highwood Uplift, has suspended at 4124 feet, 794 feet in the Madison limestone. Acidizing of the slight porosity encountered brought a yield of a few gallons daily of light oil, plus a small amount of water.

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U. S. Exploratory Completions

ARKANSAS WILDCATS

Van Buren County—Failure: Lion Oil's Griggs 1, nw se 23-10n-13w, elev 780 ft, abnd 4650 ft.

White County—Failure: O. W. Killam-L. O. McMillan's J. C. Curl 1, c ne sw 10-9n-5w, abnd 4800 ft.

CALIFORNIA WILDCATS

Fresno County—Failure: Seaboard Oil Co.'s Seaboard-Standard 72-6, ne ne 6-15-17, Kreyenhagen 5802, Eocene 6185, Domengine 6212, Cret 6270, Wheatville 6409, abnd 6455 ft.

Kern County—Failure: Standard's Standard-Fullerton 1, nw nw 25-27-23, Semitropic area, abnd 14,770 ft.

Los Angeles County — Failures: M. L. Gillespie's 1, sw sw 22-1n-17w, abnd 3172 ft.

W. G. Kreiger's Miller se se 14-5-11, abnd 2981 ft.

ILLINOIS WILDCATS

Clay County—Failure: Pure's Moseley 1-B, sw se sw 11-2n-8e, abnd 3144 ft.

Effingham County—Failure: Schoick et al's Schmohe 1, ne se se 10-7n-5e, abnd 2461 ft.

Franklin County—Failure: Nash Redwine's Franklin Mining Co. 1, nw ne se 11-7s-4e, abnd 3362 ft.

Hamilton County—Failure: Nat. Assoc. Pet.'s Good 1, se ne ne 20-3s-6e, abnd 3494 ft.

Madison County — Failure: Slagter et al's Holtman 1, se ne sw 5-4n-6w, abnd 1800 ft.

INDIANA WILDCAT

Posey County—Failure: Farm Bureau et al's Gibson 1, ne ne nw 27-4s-12w, abnd 2794 ft.

KANSAS WILDCATS

Ellsworth County—Failure: Plains Exploration Co. et al's Habinger 1, se ne sw 18-18s-9w, Arb 3208 ft, abnd 3224 ft.

Finney County—Failure: Stanolind's Fidelity St. Bank 1, c nw 34-26s-31w, Flint 2946 ft, abnd 2955 ft.

McPherson County — Failure: Panhandle Eastern's Waltner 1, sect 36-21s-3w, Kind 3440 ft, abnd 3682 ft.

Norton County — Failure: Sinclair Prairie's Reed 1, swc nw 12-4s-24w, Arb 3806 ft, Arb 3806 ft, abnd 3877 ft.

Russell County—Failure: Premier Drlg. Co.'s Hupper 1, se se nw 7-15s-12w, Lans 2992 ft, Arb 3279 ft, abnd 3300 ft.

KENTUCKY WILDCAT

Grayson County—Failure: Texas Co.'s Allen Comm. 1, 9-M-36, abnd 3160 ft.

NORTH LOUISIANA WILDCATS

Caldwell Parish: Placid Oil Co.'s Louisiana Central Lumber Co. 122, c se nw 16-11n-3e, abnd 7682 ft.

Lincoln Parish: Big West Drlg. Co.'s N. B. Gill Est. 1, c nw se 35-20n-2w, elev 151 ft, Midway 1420 ft, Nacatoch 2075 ft, Blossom 2696 ft, massive anhy 3652-4040 ft, James 4430-4534 ft, Travis Peak 5170 ft, Cotton Valley 7263 ft, red shale 5595-5604 ft, abnd 9950 ft.

NORTH LOUISIANA OUTPOST

Richland Parish—Delhi Extension: Rogers Lacy's B. May 1, c sw nw 26-17n-9e, Cook Mt. 695 ft, Wilcox 1825 ft, Midway 1858 ft, gas rock 3297-3318 ft, perf 3462-70 ft, flow 232 bbls 34-gr, 12/64-in, 388/1 gor, td 3795 ft.

SOUTH LOUISIANA WILDCAT

Cameron Parish—Failure: Yegua Corp.'s A. P. Dobbertine 1, 1650 w 990 n of sect 9-15s-14w, td lst hole 6363 ft, pb and st 5400 ft, sso 8237 ft, lost returns, stuck dp 4300 ft, jnkd and abnd 4300 ft.

SOUTH LOUISIANA NEW PAY TEST

St. Mary Parish—N. Jeanerette Oil Discovery: Atlantic's Teche Sugar Co. 1, 7000 s 2735 e of nwc 19-13s-9e, perf 96 shots 11,880-92 ft, flow 76 bbls 50.5-gr, 3/16-in, gor 12,767/1, tp 2100 lbs, td 12,992 ft.

MISSISSIPPI WILDCATS

Lamar County—Failure: Sinclair Wyoming's Newman Lbr. Co. 3, c ne sw 5-5n-16w, elev 415 ft, Wilcox 2968 ft, Midway 5820 ft, Selma 6710 ft, no shows in Eutaw 8087 ft, Marine Tuscaloosa 9402 ft, massive anhy 9717 ft, L Cret 9928 ft, abnd 11,393 ft.

Lauderdale County — Failure: Providence Drlg. Co.'s Flintkote 1, 20-8n-18e, elev 351 ft, Tuscaloosa 2898 ft, perf 24 shots 1643-47 ft, 2000 gals acid, abnd 3005 ft.

Webster County—Failure: Webster County Oil Dev. Tr.'s State 1, 15-21n-8e, Travis Peak 2685 ft, Cotton Valley 2750 ft, abnd 3538 ft.

NEW MEXICO WILDCATS

Lea County—Failure: Cade & Harrell's Prior 1, c sw sw 11-20s-32e, elev 3459 ft, anhy 888 ft, salt 1030-2580 ft, lime 2660 ft, abnd 2927 ft.

OKLAHOMA WILDCATS

Comanche County—Failure: Sinclair Prairie's Ziegler 1, sw nw nw 53-3n-10w, red shale 651 ft, abnd 1827 ft.

Logan County—Oil Discovery: R. E. Havenstrite's Havenstrite 1, nw ne ne 14-18n-4w, flow 151 bbls oil, 15 bbls wtr, Layton sd 4210-25 ft, td 4225 ft.

Major County—Oil Discovery: Cities Service's Mariner 1, nw ne nw 27-22n-10w, flow 2500 bbls, Arb 5247-97 ft, td 5297 ft.

Noble County—Failure: Watchorn O&G's Herschman 1, sw nw ne 25-21n-1e, 2nd Wx 5000 ft, abnd 5027 ft.

Semniole County—Failure: Schermerhorn Oil Corp.'s Kouri 1, sw nw ne 13-10n-7e, abnd 3671 ft.

Tillman County—Discovery: Gulf's Copeland 1, c n½ ne nw 31-1s-18w, flow 127 bbls 36-gr, Arb 4580 ft, abnd 4584 ft.

WEST TEXAS WILDCATS

Cochran County — Failure: Honolulu Oil Corp.'s Hudson 1-B, 990 ft out sec PSL 5, blk P, 1½ mi nw of extension pumper, elev 3720 ft, anhy 2360 ft, brown li 3970 ft, San Andres 4350 ft, abnd in sul ftr 5137-55 ft.

Howard County—Failure: Cosden Pet. Corp.-John I. Moore's Cosden 1, c ne sw T&P Ry. 38, blk 32, T-1-N, elev 2483 ft, li 2650 ft, abnd 5503 ft.

Lubbock County—Failure: Magnolia's L. D. Johnson 1, c ne ne D&D Ry. 88, blk C, elev 3166 ft, San Andres 2890 ft, Glorietta 4130 ft, Clear Fork 4580 ft, Wichita-Albany 6000 ft, Pennsylvanian series 6540 ft, Pennsylvanian sh 7355 ft, Mississippi 9550 ft, Woodford 10,011 ft, detrital 10,054 ft, Ellenburger 10,066 ft, granite 10,171 ft, abnd 10,178 ft.

Lynn County—Failure: D. D. Feldman et al's Edwards 1, c se se E.L. & RR Co. 312, blk 3, elev 3174 ft, anhy 2050 ft, San Andres 4040 ft, San Angelo 4960 ft, jkd 6982 ft.

Menard County — Failure: Phillips' W. M. Martin-Meta 1, 660 ft out sec J. W. Bradford sur No. 501, elev 2035 ft, Ellenburger 2265 ft, granite-wash 3830 ft, abnd in granite 3939 ft.

Pecos County—Failure: Phillips' Ada Price 1, c se nw T.C. Ry. 11, blk 101, 2nd deepest test in world, elev 3257 ft, Trinity 509 ft, dolomite 1810 ft, Simpson 13,100 ft, Ellenburger 15,075 ft, abnd 15,279 ft.

Runnels County—Failure: Hunter & Hunter's Brandon 1, 330 ft out nwc se sect 124, S. J. Lewis sur, elev 1936 ft, Palo Pinto 3140 ft, abnd 4080 ft.

WEST TEXAS NEW PAY TESTS

Andrews County—Union Field Failure: Union of Calif.'s Biles 9, c se sw PSL 12, blk A-31, elev 3403 ft, base salt 2800 ft, San Andres 4430 ft, San Angelo 5640 ft, Clear Fork 6120 ft, abnd in Devonian 8803 ft.

Ector County—Embar Field Failure: Texas Co.-Phillips' J. F. Cowden 1, c nw ne T&P Ry. 7, blk 44, T-1-N, elev 3226 ft, Grayburg 3750 ft, San Andres 4060 ft, Glorietta 5250 ft, Wolfcamp 7690 ft, Simpson 8010 ft, Ellenburger 8706 ft, abnd 8967 ft.

SOUTH CENTRAL TEXAS WILDCAT

Dimmitt County — Failure: W. J. Walton-George W. Lyles' Julian K. Frost 1, 467 fr wsl 106-ac tr, John Sharp sur, 467 ft sel 4571 fr nel sur 150 ft ne Walton & Galt's Frost 1, abnd 7002 ft.

SOUTHWEST TEXAS WILDCATS

Jim Hogg County — Gas Discovery: S. F. Hurlbut-Gulf States Oil Co.'s J. Vela Pena 1, 330 fr nl 330 fr wl blk 10 M. W. White subdvn El Peylote Gr 80-ac lse, elev 720.3 ft, 25 perfs 3149-55 ft, flow est 12 mln gas open, tp 500 lbs, td 3169 ft.

McMullen County—Failure: Humble's E. M. Baker 1, 660 fr wl 3300 fr nl M. F. sur 6, 7330-ac lse, 7 mi s of Edwin Jones C-2, abnd 9031 ft.

Starr County—Failure: W. W. Zimmerman & Co.'s Mary Hedley Edgerton 2, 330 fr nl 431 fr wl 240-ac lse, porc 80 sh 66 blk 11, 100 e of Baldridge & King's Edgerton 1, elev 335 ft, abnd 1207 ft.

LOWER TEXAS COAST WILDCAT

Hidalgo County — Failure: Hamman O&R Co.'s John & George Hamman 2, 5278 fr sl 11,016 fr nl Jackson subdvn Milado tr, 24,000-ac lse, San Salvador del Tulle Gr, 3700 ft ne of No. 1, abnd 8155 ft.

Jackson County—Failure: Donald W. Moore-T. J. Ahern's Four Way Ranch 1, 467 fr nsel blk 91 D. Aldrich sur, 40-ac lse, elev 60 ft, abnd 7008 ft.

Jackson County—Gas Discovery: Stewart's A. E. Westhoff et al 1, 660 ft el 467 fr sl 120-ac lse, Jos. Rector Lge, 1½ mi se Edna, elev 71 ft, dual comp, perf 5428-40 ft, flow est 2,170,000 gas, ½-in; perf 5964-72 ft, flow 3,050,000 gas, ½-in, td 6516 ft.

Lavaca County—Condensate Discovery: Sterling O&R Co.'s Seekamp & Palmer 1, 660 ne&nw 160-ac lse, being c of n 40-ac of 160-ac, Jonathan Johnson sur, elev est 170 ft, perf 7700-50 ft, flow 48 bbls 53.8-gr, ¼-in, gor 40,000/1, td 8848 ft.

San Patricio County — Failure: Magnolia's

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TEXAS GULF COAST WILDCATS

Colorado County—W. Orange Hill Gas Discovery: Pan American Prod. Co.'s R. L. Williams 1, 1787 fr nwl 1787 fr nel sect 663 and CTRR sur, 11,900 ft ne Cities Service's Winnie Poole 1 at Ramsey field, pay 8368 ft, 155 perfs 8368-90 ft, flow 3,156,000 gas, no gge on cond, 17/64-in, td 9250 ft.

Grimes County—Failure: C. H. Murdick's Myrtle Stoneham 1, 330 fr n&wl 80-ac lse 3630 a 7480 e of nwc Franklin Greenwood sur, abnd 3810 ft in shale.

Liberty County—Oil Discovery: Shell's Grogan Mfg. Co. et al 1, 1011.3 s 2500.6 w of swc Shell's Jacob Cherry lse, 380 n of nl of J. G. Puterbaugh sur, n of Cleveland field in Clayton Harper sur on 526.1-ac lse, elev 150 ft df, perf 16 shots 5782-84 ft, flow 294 bbls 40.3-gr oil, 2% wtr, ¼-in, td 12,250 ft, pb 5785 ft.

Wharton County—Failure: Jack W. Frazier's Otto Mathys 1, 1980 fr n&wl 291.85-ac Mathys lse on 80-ac tr, Henry Griffith sur, abnd 6367 ft.

TEXAS GULF COAST NEW PAY TEST

Brazoria County—Allen Dome Failure: Gulf's S. M. Allen et al 2, 5460 fr el 1701 fr sl Sterling McNeil sur A-94 and sect 67, 7253.83-ac lse, tested 11,150-58 ft, 10,875-925 ft, 10,875-90 ft, abnd 12,667 ft in shale.

EAST TEXAS BORDER COUNTIES

Cass County—Failure: J. Simmons et al's Frost 1, 1400 s of nl 600 e of wl T. E. Tucker sur, se Bryan Mills, elev 301 ft, good gas odor and fair blow on surface in dst at 6190 ft, Blossom 2840 ft, Woodbine 3438 ft, Commanche li 3743 ft, Goodlan li 4392 ft, base Goodlan 4445 ft, Paluxy 4445 ft, anhy 5730 ft, mass anhy 6016 ft, base Massive 6190 ft, L. anhy 6254 ft, base Rodessa 6708 ft, Pettit 6855 ft, Travis Peak 6979 ft, abnd 7510 ft.

Harrison County—Failure: Stanolind-Continental's J. S. Harris 1, 1980 fr nl 660 fr wl 410-ac tr, T. Gray sur, 3 mi se Woodlawn, sso and sw 6492-6520 ft, Pettit por 6505 ft, Travis Peak 6654 ft, abnd 6870 ft.

Shelby County—Failure: H&A Corp.'s Hayden 1, 1350 fr sl 640 fr el 152-ac tr in D. T. F. Yorkdt sur, formerly Roger Lacy's No. 1, elev 328 ft, Massive 5342 ft, Pettit 6155 ft, abnd 7020 ft.

NORTH TEXAS WILDCATS

Archer County—Failures: D. H. Bolin et al's Young 1-A, 195 ft wel 3375 ft snl TE&L Co. sect 2486, abnd 1535 ft.

Panhandle Ref. Co.-S. D. Johnson's Edwards 1, 990 ft out swc stct 37, Madison County School Lands, elev 993 ft, top Bend 5347 ft, abnd 5426 ft.

D. H. Bolin et al's Garvey 1-A, 900 ft snl and 600 ft ewl blk 94, Jefferson CSL, abnd 1235 ft.

Clay County—Failure: Stanolind's Gray 1, 440 ft out sec n½ TE&L Co. sect 2801 , elev 1034 ft, jkd 5261 ft.

Cooke County—Failures: Allied Pipe Line Co.'s Solomon 1, 330 ft nsl 2585 ft ewl John Musick sur A-780, top Ellenburger 1549 ft, abnd 1688 ft.

Kerlyn Oil Co.-Phillips' H. C. Hay 1, 1900 ft s 580 ft e of sec S. D. Brown sur, but in Amos C. C. Bailey sur A-44, elev 788 ft, top Ellenburger 3837 ft, abnd 4280 ft.

Throckmorton County—Oil Discovery: James Stewart & Co.'s Tharp 1, 467 ft out sec TE&L Co. sect 3007, 2 mi nw of Ewalt pool, elev 1295 ft, Gunsight 1070 ft, Bend 4250 ft, Mississippi 4822 ft, pump 171 bbls oil, 34 bbls wtr, 1000 gals acid, Bend perf 4260-70 ft, td 4885 ft.

Young County—Failure: Calapor Mfg. Co.-Wilmac Oil Co.'s Jeffery 1, 467 ft s 467 ft w of sec of D. Brown sur A-16, but in TE&L Co. sect 3408, elev 1160 ft, Home Creek 630 ft, Palo Pinto 1423 ft, Bend 3817 ft, Marble Falls 4367 ft, Miss. 4795 ft, Ellenburger 4940 ft, abnd 4993 ft.

Wilbarger County — Odell Field Outpost: Fain & McGaha's Carmichael 1, 440 ft out nec s½ H&TC Ry. 3, blk 10, elev 1372 ft, Palo Pinto 4756 ft, abnd 5000 ft.

NORTH TEXAS NEW PAY TEST

Young County — Farmer-Garvey Discovery: Standard of Ohio's J. R. Garvey-Garr 2, 1184 ft snl 33 ft wel of 220-ac of BBB&C Ry. sect 1, A-35, offsetting Bend wells, elev 1132 ft, Homecreek 1230 ft, Bend 4428 ft, Mississippi 5162 ft, flow 465 bbls 45.9-gr, 7% wtr, gor 900/1, natural via ½-in, Miss perf 5186-5216 ft, td 5340 ft.

WESTERN CANADA WILDCAT

Alberta Foothills Belt — Millburn Creek: Wesreserve Oil's No. 1, lsd 7, 36-23-4w5th, abnd 5959 ft, dr Belly River formation fr sur, excessive thickness doubled original Madison li est of 6800 ft.

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United States Wildcat Starts

CALIFORNIA

Kern County: Trico Oil & Gas Co.'s Keating 3, nw ne 20-27-27 McVan area, lcn.

Los Angeles County: Standard Oil Co.'s Wigdal 1, sw ne 19-3-16 Aliso Canyon area, lcn.

Sacramento County: Texas Co.'s Walnut Grove Unit 1, 35-5n-4e Gas test, Walnut Grove area, lcn.

GEORGIA

Echols County: Hunt Oil Co.'s Superior Pine Products Co. 2, swc ld lot 317 ld dist 13, lcn.

ILLINOIS

Hamilton County: Tide Water's Johnson 1, se se nw 33-6s-5e, lcn.

Richland County: Pure's Hill 1, ne se ne 14-3n-9e, dr.

St. Clair County: Luthell's Hagemann 1, nw nw ne 10-2n-6w, dr.

White County: Weinert's Kisner 1, sw ne se 31-5s-9e, dr.

INDIANA

Posey County: Bonnie Heath's Bailey 1, sw sw ne 21-4s-13w, lcn.

KANSAS

Dickinson County: National Drlg. Co.'s Doyle 1, c e ne se 22-16s-4e, dr.

Kingman County: Bridgeport's Amerine 1, swc 1-27s-10w, rur.

Stafford County: Helmerich & Payne's Asher 1, ne se se 4-21s-14w, lcn.

NORTH LOUISIANA

DeSoto Parish: Tom Palmer's Walter Hill 1, c nw se 3-10n-13w, lcn Pettit test.

Franklin Parish: American Liberty Oil Co.'s J. B. Kny 1, 210 fr wl nw nw 12-16n-8e, 3800-ft test, prep spud.

Madison Parish: Woodley Pet. Co.'s Montgomery 1, c nw se 14-15n-9e, lcn 6000-ft test.

SOUTH LOUISIANA

Cameron Parish: Superior of Calif.'s State-Gulf of Mexico 12, 5637.6 s 250 e of nwc 4-15s-8w, Creole area, lcn 9000-ft test, ru.

Vermillion Parish: California Co.'s Jan Jean Lafitte 1, begin sec 12-17s-2e, go n 35° 57 mins 10 secs w 14,707 in 35-16s-2e, lcn 12,500-ft test.

MISSISSIPPI

Claiborne County: Pure's A. L. Chapman et al 1, 530 sw alg m/wly/nwl of irreg sect 13 th 467 se at ra to lcn in 13-11n-3e, 10,500-ft test.

Jones County: Gulf's W. A. Valentine 1, 660 e nwc ne¼ nw½ 4-9n-13w, bldg rds.

NEBRASKA

Gage County: Gage Development Co.'s Stanoshazk 1, nwc 24-1n-6e, dr.

NEW MEXICO

Lea County: El Paso Nat. Gas Co.'s State-Ramsco 1, c sw sw 36-16s-35e, lcn 5300-ft San Andres test.

Gulf's Pike 1, c nw ne 6-23s-38e, lcn 6500-ft Clear Fork test.

OKLAHOMA

Cotton County: Fidelity Royalty Co.'s Russell 1, nw nw se, lcn.

Garfield County: Champlin Refg.'s Hayes 1, se nw nw, bldg rig.

Stephens County: Ashland O&G's Harley 1, nw sw, lcn.

Tilman County: Leo Moore et al's Rollins 1, c sw nw 8-1s-18w, rur.

Texas Co.'s Taylor 1, se se ne 36-1s-18w, mit.

WEST TEXAS

Andrews County: DeKalb Agricultural Assn's Lockhart-Brown 1, near c se nw PSL 15, blk A-42, 1¼ mi nw Mascho field, but separated by failure, lcn.

Concho County: Northern Ordnance's Mrs. Leta Sorrell 1, 2318 ft snl 2316 ft ewl Sect 206, Elizabeth Kempner sur, 3750-ft Ellenburger rotary test, dk.

Crockett County: Guffey Drilling Co. et al's G. L. Thompson-Watchorn 1, 1689 ft snl 6690 ft wel I&GN Ry. 73, blk 1, lcn 1500-ft cable test.

Lynn County: D. D. Feldman and F. A. Callery's Edwards 1-a, 660 ft wel 880 ft nsl E. L. & Ry. 312, blk 3, 200 ft n of 6982-ft jkd test, mim for 7500-ft test.

Pecos County: Bryce McCandless et al's Atlantic Ref.-Cordova-Union 1-11, c se nw H&GN Ry. 111, blk 11, lcn 4500-ft Ellenburger test.

Upton County: Gulf's J. D. Starnes 1, 660 ft wel 3300 ft nsl sect 1, J. R. Prater sur A-351, lcn 7000-ft Ellenburger test.

WEST CENTRAL TEXAS

Jones County: Con-Tex Pet Corp. et al's Guitar Trust Est. 1, se se se T&P Ry. 23, blk 14, lcn 2150-ft test.

Stephens County: Sinclair Prairie's E. S. Curry 1, 330 ft out nec TE&L Co. sec 2264, rur for 4600-ft Ellenburger test.

SOUUTH CENTRAL TEXAS

Gillespie County: L. Underwood Rowntree's Richard Knott 1, 330 ft sl 1170 fr wl 351-ac lse, S. R. No. 154, 8 mi e of Harper, lcn 1500-ft test.

Medina County: John I. Moore's A. J. Wurzbach 1, 333 fr wl 990 fr sl 420-ac tr, sect 374, Juana Delgado sur 1, 3500-ft test reinstated, dr 2221 ft.

SOUTHWEST TEXAS

Duval County: Agro Oil Co.'s Carrillo Heirs 1, 330 ft sw&nwl 360-ac lse, AB&M sur 182, 5000-ft test, ru.

Starr County: Sun's Isabel V. Montalvo et al B-3, 467 fr wl 4251 fr el 5000 fr sl tr "B", 3870-ac lse, Los Retachez Gr, 4054 n ne cr No. A-1, lcn 7500-ft test.

Webb County: Coastal Refineries' A. M. Brun A-1, 330 fr sl 1650 fr el blk 48 of Brown subdvn, 160-ac lse, lcn 2000-ft test.

LOWER TEXAS GULF COAST

Brooks County: Texas Co.'s Mary M. Lasater 3, 4620 fr e&nl 2600.86-ac lse, Loma Blanca Francisco Guerra Chappa Gr, Burton and Danforth subdvn of Parrita Rch, 4174 e se of No. 2, lcn 10,000-ft test.

San Patricio County: H. H. Howell's C. A. Maedgen 1, 467 fr nw&nel 204-ac lse, Mathis Rch subdvn blk 4, 5000-ft test reinstated, coring 4544 ft.

TEXAS GULF COAST

Chambers County: Sun's A. V. Wolfean et al 1, 2100 e of wl 700 s of nl R. O. W. McManus sur A-187 and on 40-ac unt of 80-ac lse, lcn 9200-ft test.

San Jacinto County: Navarro Oil Co.'s Foster Lbr. Co. 2, 993 s 66° 30 mins w of No. 1 1006-ac lse, George Taylor sur A-292, 2 mi s Cold Springs, lcn 8500-ft test.

EAST TEXAS BORDER COUNTIES

Harrison County: D. E. and R. J. Whelan's Wm. Pool Est 1, 2350 ft wl 990 fr sl Betty Humphries sur 126.5-ac tr, Travis Peak test, bldg roads.

NORTH TEXAS

Archer County: Wilder Drl. Co.'s C. L. Abercrombie 1, 150 ft fr m/s/n 750 ft fr m/w/wl s. Abercrombie sur A-752, lcn.

C. T. Hedges et al's J. S. Walsh 1, 300 ft nsl and 250 ft ewl TE&L Co. sect 2416, mim.

Mrs. Hulda B. Wallace et al's R. L. Kempner 1, 350 ft nsl 2330 ft wel S.P. Ry. 2, A-967, lcn 5000-ft Ellenburger test.

Clay County: Continental's W. M. Hillin 1, 467 ft snl 1400 ft ewl TE&L Co. sect 3290, 2 mi se Wynn field, lcn 7200-ft Ellenburger test.

Stanolind's C. A. Gray 1-a, 400 ft wel 515 ft nsl of n½ TE&L Co. sect 2801, twin to 5251-ft jkd hole, mim for 7500-ft Ellenburger test.

King County: Mid-Continent's S. B. Burnett 1, 987 ft wel 950 ft nsl of G. W. Lampson sur A-247, lcn 6000-ft Ellenburger test.

Wichita County: Rathke Oil Co.'s J. F. Vogel 1, 150 ft ewl 1100 ft snl of se¼ H&GN Ry. sect 35, A-163, lcn 600-ft cable test.

Wilbarger County: G. E. Kadane & Sons' G. C. Hale 1, se se se H&TC 34, blk 13, lcn 5500-ft Ellenburger test.

Young County: Shell's R. E. Hoffman 1, 330 ft out nwc of s 143½-ac, TE&L Co. sect 1443, 5200-ft Ellenburger test, dr 500 ft.

WESTERN CANADA

South Alberta Plains—Conrad: Mid-Continent O&G-East Crest Oils' No. 1, se lsd 2 18-6-15w4th, mir.

Alberta Foothills Belt—Jumping Pound: Shell of Canada's No. 10-14-J, lsd 10 14-25-5w5th, mir.

Natural Gasoline Group Postpones Annual Meet

The 24th annual convention of the Natural Gasoline Association, scheduled for Dallas April 11-13 has been indefinitely postponed. A special meeting of the directorate to transact annual business and consider matters of policy will be held on a date not yet set.

Graduate Fellowships

Graduate fellowships of the mining experiment station are open for the academic year 1945-1946, at Missouri School of Mines and Metallurgy, Rolla, Missouri. Advanced academic work and research leading to master's and PhD. degrees may be taken in mining (including the mining geology and petroleum options), ceramics, metallurgy or geology. Applicants should address inquiries to Dean Curtis L. Wilson.

Squeaks from the Bull Wheel

—The Pelican

"We've been stranded here one-two-three years."

Bedtime Story

"So your wife crawled to you on her knees last night?"

"Yep, and dared me to come out from under the bed."

Could Be

"What was one of the greatest obstacles in building the Panama Canal?"

"Dirt."

Pleasure to Come

"Mary, have you ever awakened in the morning with a grouch?"

"No, I've never been married."

Sunday Morning

"Have you got change for a dime?"

"Here you are, sir—and I hope you enjoy the sermon."

Perfect Profession

A doctor whose specialty was skin diseases was asked why he selected that particular branch of medicine.

"Because my patients never get me out of bed at night, they never die and they never get well."

Definitions

A blonde is an established bleachhead.

A burlesque salad is a tomato without dressing.

New Discovery

There was a young girl
from Australia
Who went to a dance
as a dahlia.
When the petals uncurled,
It revealed to the world
That the dahlia, as a dress,
Was a failure.

That Stopped 'Em—

"McTavish, here comes a guest for supper."

"Quick, everybody! Grab a tooth pick and run out on the front porch."

Be Careful, Cousin

"Are you fond of nuts?"

"Is this a proposal?"

Wolf Walloped

"You say you got that black eye fighting for a woman's honor?"

"Yep, she wanted to keep it."

Poet's Nook

Here lies Mary's little lamb;
She fed it kerosine.
One day it got too near the fire,
Since then it's not benzine.

Grounds Aplenty

"Wife, I'm going to divorce you."

"But you haven't any grounds for divorce."

"Yes, I have. I found out today your father had no license to carry a gun."

Feeling Friendly

"I feel as though I'd known you always."

"I'll say you do!"

She Shares Her Burden

"I'm getting married. A wife is a great help to a man."

"Yes, she'll stand by you in all the troubles you wouldn't have had if you hadn't married her."

Phooey on Ewe

"You say your girl is just like a lamb?"

"Right. Every time I make a suggestion she says, 'Bah'!"

Accepted for Service

"Well, doctor," said the Army candidate after the examination, "how do I stand?"

"Goodness knows. It's a miracle!"

Not Stretching, Either

A sweater is a good investment for a girl. She gets out of it what she puts in it and draws considerable interest, too.

No Wonder

"This coffee tastes like mud."

"Well, it was ground this morning."

This Curious World

When a man has a birthday, he takes a day off; when a woman has a birthday, she takes a year off.

A certain Scotch horseman never buys more than one spur, explaining that if he can get one side of the horse to move, the other side will go along, too.

Show me the woman who cares nothing for male admiration. Although ordinarily I dread the sight of a corpse.

The biggest wolves in the world are Chase and Sanborn—they date every bag.

Love at first sight was invented by a soldier on a two-day leave.

The only one who should put faith in a rabbit's foot is a rabbit.

A gossip is a person who talks to you about others. A bore is one who talks to you about himself. A brilliant conversationalist is one who talks to you about yourself.

Sow your wild oats in a hotel and a detective will come up.

The best place to find a helping hand is at the end of your arm.

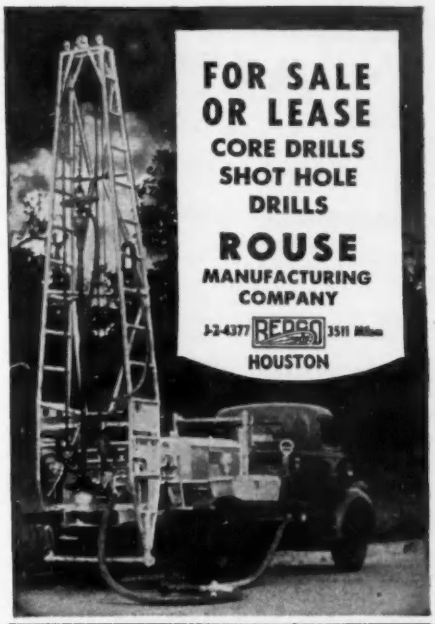

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Fig. G-700

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New York 7 Cleveland 15 Chicago 16 Houston 1
Western Territory
QUAKER PACIFIC RUBBER COMPANY
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Men in the Industry's News

A. I. LEVORSEN, independent research geologist of Tulsa, and presidentin in 1935 of American Association of Petroleum Geologists, has been appointed professor and executive head of the department of geology at Stanford University. He will arrive at Stanford in September.

A. I. Levorsen

Levorsen, editor of "Possible Future Oil Provinces of the United States and Canada" and "Stratigraphic Type Oil Fields," in addition to numerous other technical studies, is a 1917 graduate of Minnesota and has worked for several oil companies. A member of the National Research Council, he is also a councilor of the Geological Society of America and the Society of Economic Geologists. For the past 7 years he has been chairman of the research committee of AAPG.

During the past few years he has been a visiting lecturer on geology at many major universities.

R. L. MINCKLER has been elected vice president of General Petroleum Corporation, Los Angeles. With the company since 1924, Minckler was, at the time he was loaned to the government, assistant to the president, a director, and chairman of the supply committee. He became a director in 1941. He spent 15 months immediately following Pearl Harbor in Washington as director of petroleum supply of PAW.

W. G. TERRY will have charge of a new district land office for Forest Development Corporation at Jackson, Mississippi. He previously served the firm in West Texas with headquarters at Midland.

WESLEY WEED, South Texas scout and landman for Sun Oil Company, has been transferred from Alice to San Antonio, where he becomes assistant district landman. He is succeeded by G. C. Campbell, formerly at Tyler, and the latter will operate from Corpus Christi.

MAX M. MAHAFFEY of El Dorado, Kansas, has been transferred to Bartlesville, Oklahoma, as division superintendent in charge of gas activities for Cities Service Oil Company. J. R. Hatfield of Bartlesville has been promoted to chief petroleum engineer of the company's oil production division.

PROF. W. L. NELSON of the school of engineering, University of Tulsa, spoke at the weekly meeting of the Engineers Club of Tulsa, outlining activities of the Tulsa Quartermaster Petroleum School established to train war technicians.

HENRY EMMET GROSS, formerly chief of the reservoir engineering section of PAW in Chicago, has joined Kingwood Oil Company, Effingham, Illinois, as petroleum engineer. He previously was associate professor of petroleum engineering at Texas A. and M. College and assistant professor of petroleum engineering at the University of Oklahoma.

DR. WALTER HULL ALDRIDGE, president of Texas Gulf Sulphur Company, and Dr. Walter Curran Mendenhall, retired director of the United States Geological Survey, have been elected to honorary membership by the American Institute of Mining and Metallurgical Engineers.

Aldridge, head of the sulphur company since 1918, was awarded the William Lawrence Saunders medal in 1918. Mendenhall joined the geological survey in 1895 and in 1931 became director. In 1933 he organized and directed the International Geological Congress in Washington.

SAM H. HARPER, division purchasing agent for the Gulf Coast division of The Pure Oil Company, took over his duties as director of materials division of PAW, District 3, on February 16. Harper has been with Pure for 24 years, having been associated with the materials and purchasing department since he joined the company during the Mexia boom. He was moved into the Dallas office in 1924, and was made assistant purchasing agent in the Fort Worth office in 1927. When the Gulf Coast division was established in Houston in 1929 he was placed in charge of the purchasing department and has held that position since.

Sam H. Harper

LT. COLONEL A. B. STEVENS, recently promoted to this rank, is with the military pipe line group in Paris, France. A professor of petroleum engineering at A. & M. before entering the armed service, Stevens is on leave from the college.

Deaths

LELAND P. HARRINGTON, 67, assistant secretary and treasurer of the Pure Oil Company's southwestern division, died in Tulsa February 19. Harrington joined Pure in 1906 and went to Oklahoma in 1919 with the Oklahoma Producing & Refining Company, later being elected secretary and treasurer. When the company was acquired by the Ohio Cities Gas Company it reestablished Harrington's service record with the firm and soon afterwards the company was renamed The Pure Oil Company. As a result he was ranked as one of Pure's 30-year men in 1936.

JAMES BRANN, pioneer independent operator, died in Bartlesville, Oklahoma, February 15. He drilled his first oil well in Warren County, Pennsylvania, in 1883 and completed his first Oklahoma well at Cleveland in 1905. For 40 years he operated properties in the Osage country, being active until five years ago. He also held interests in Oklahoma, Pennsylvania, Indiana, Illinois and Kansas.

Notes for the Equipment Buyer and User

Pillow Block Bearing

DODGE MANUFACTURING CORPORATION

The Dodge Manufacturing Corporation, Mishawaka, Indiana, announces a bearing known as Type "E", available in both pillow blocks and flanged units. The bearing was engineered to provide all features necessary for satisfactory performance under normal service conditions at a low price. It is claimed that the bearing will give 30,000 hours or more of service under conditions for which it is adapted.

The method of fastening the bearing to the shaft is as follows: On each end of the extended inner race is a steel collar having two headless set screws spaced 120 degrees apart and extending through clearance holes in the inner race to the shaft. These four set screws provide a positive lock to prevent rotation of the inner race on the shaft.

Housings are compact and rugged and are precision machined to close tolerances on automatic machines.

Effective labyrinth seals prevent loss of lubricant and protect bearings against dust, dirt, or moisture. These seals are equally effective whether the bearing is on or off the shaft. The bearings are completely assembled, lubricated and adjusted at the factory.

Manhattan Rubber Honors 50-Year Plant Employes

Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, New Jersey, honored its first two 50-year plant employes, Andrew N. Van Riper and Morris G. Fitts, at a dinner. By rounding out 50 years of service with the company, these two joined a group composed of three others, F. L. Curtis, vice president and treasurer; Charles H. Kuhn of the New York sales force, and Charles E. Cummings, assistant secretary.

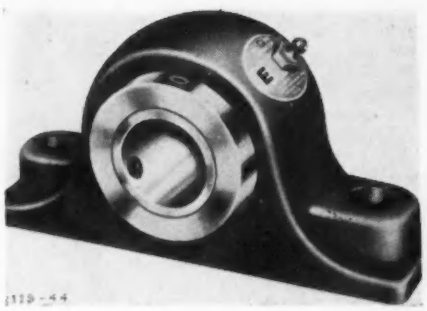
The dinner also marked the organization of the Manhattan Pioneers, composed of employes who have been with the company 25 years or longer.

Homco Catalog Issued

Houston Oilfield Material Company, Houston, has published a catalog of cutting and fishing, sidewall coring, directional drilling and other specialized tools for oil field use. Special Catalog B, as the new publication is called, is illustrated in three colors, contains a pictorial index of the tools, presents brief facts about cutting and fishing articles, and describes the operation of the tools and lists specifications, parts numbers and prices.

Hercules Issues Booklet

Hercules Motor Corporation, Canton, Ohio, has published a booklet under the title of "Hercules and the War." Subject matter of the publication has been written by Lowell Thomas, famous radio commentator and writer and is presented as an account of a trip through the Hercules plant.



Dodge Pillow Block

Sterling Is Honored

The Sterling Engine Company, Buffalo, New York, has been awarded the third white star to its Army-Navy E flag signalizing continuation of high production standards for war equipment. The first award was made in April, 1943.

Pump Bulletin Issued

The Byron Jackson Company, Pump Division, P.O. Box 2017 Terminal Annex, Los Angeles 54, California, has issued a bulletin, No. 44-5000 on deep well pumps. The bulletin is printed in three colors and includes cut-away sketches to show three deep well pump types having more than 100 impeller designs, each with different hydraulic characteristics.

Vertical Multi-Stage Pump

BYRON JACKSON COMPANY

Byron Jackson Company, Pump Division, P. O. Box 2017 Terminal Annex, Los Angeles 54, California, has published bulletin 44-4620 describing a vertical multi-stage pump, designed for handling liquids, hot or cold, corrosive or non-corrosive, where the net positive suction head is limited.

Construction detail is shown, and standard specifications are given, as well as dimensions of various standard sizes. Capacities are up to 1000 gallons per minute, against heads up to 250 pounds per square inch.

Pipe Stress Gauge

M. W. KELLOGG COMPANY

The M. W. Kellogg Company, Jersey City, New Jersey, has developed an apparatus for the determination of pipe stress, especially those which are beyond the practical scope of mathematical computation. Millionth-of-an-inch precision is claimed to be the standard achieved by this device.

The basic and exclusive feature of the equipment is a series of electrical measuring heads, each containing six gauges which are refined to such a degree that they can register stress deflections of a millionth of an inch.

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The superiority of Patterson Sectional Steel Buildings is neither an accident nor an incident. It is the result of 23 years experience in meeting the needs of the oil industry and other industries. They combine broad experience with engineering knowledge, skilled workmanship and modern plant facilities. Among the advantages of Patterson Sectional Steel Buildings are the following:

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Metallurgical Engineer Joins Climax Molybdenum

Climax Molybdenum Company, New York City, announced that R. L. Heath has recently joined the company at metallurgical engineer, with headquarters in St. Louis. He has been chief metallurgist with the Allison Division of General Motors Corporation, Indianapolis.

R. L. Heath

Heath was also active in the American Society for Metals, having been chairman of the Indianapolis Chapter, and chairman of the Constitution and By-Laws Committee in 1940-41.

American Brake Shoe Firm President Is Selected

American Brake Shoe Company of New York announces that T. W. Pettus has been named president. He also is president of the National Bearing Division of the company, and until recently has been executive vice president of the National Bearing Metals Corporation. The latter corporation was merged with American Brake Shoe Company in December and became a full-fledged division.

Norvell-Wilder President, General Manager Chosen

Norvell-Wilder Supply Company, Beaumont, Texas, announces election of Lap Norvell as president and general manager. He has been vice president and general manager for three years and has been associated with the company for 25 years. E. W. Gildart was elected a vice president.

Other officers reelected were Frank S. Carothers, vice president and manager of the company's Houston branch, and A. H. Schultz, secretary and treasurer.

Members of the board of directors are Mrs. Pansy Yount, J. H. Phelan, E. W. Gildart, M. T. Schlicher, R. E. Masterson, Norvell, Carothers and Schultz.

AIMME Silver Medal Won By National Tube Official

E. Chester Wright, chief metallurgist and assistant to the president of the National Tube Company, Pittsburgh, was recently awarded the Robert Hunt Silver Medal and Certificate for 1945 by the American Institute of Mining and Metallurgical Engineers, in New York. The award was made to Wright for the improvement in the process of making Bessemer steel, as described in a paper, "The Manufacture and Properties of Killed Bessemer Steel."

The steel described in the paper is used for making seamless steel tubes, particularly the type of pipe for transporting oil—as in the Big Inch pipe line and those that have supplied armed mechanized units in North Africa and France.

Manager of Sales Selected By Carnegie-Illinois Firm

Carnegie-Illinois Steel Corporation, U. S. Steel subsidiary, Pittsburgh, Pennsylvania, anonunces that Frank T. Bumbaugh has been promoted to manager of sales. He succeeds the late Frank L. Gibbons, whose assistant he has been for the last three years. Bumbaugh joined the company in 1926.

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The OIL WEEKLY

World Oil Atlas

SHOWING LOCATION OF PRODUCING OIL FIELDS, PIPE LINES AND REFINERIES IN ALL COUNTRIES OUTSIDE OF THE UNITED STATES

The maps presented in this World Oil Atlas have been standardized to the extent that the same symbols have been used throughout for fields, refineries, pipe lines and other designations, and with all field names spelled with capital letters and all town names spelled in small letters. The maps are drawn so that the center of each map is on a north-and-south line. All maps are copyrighted under the general copyright on the December 11, 1944, issue of THE OIL WEEKLY, and may not be reproduced, in whole or part, without written permission.

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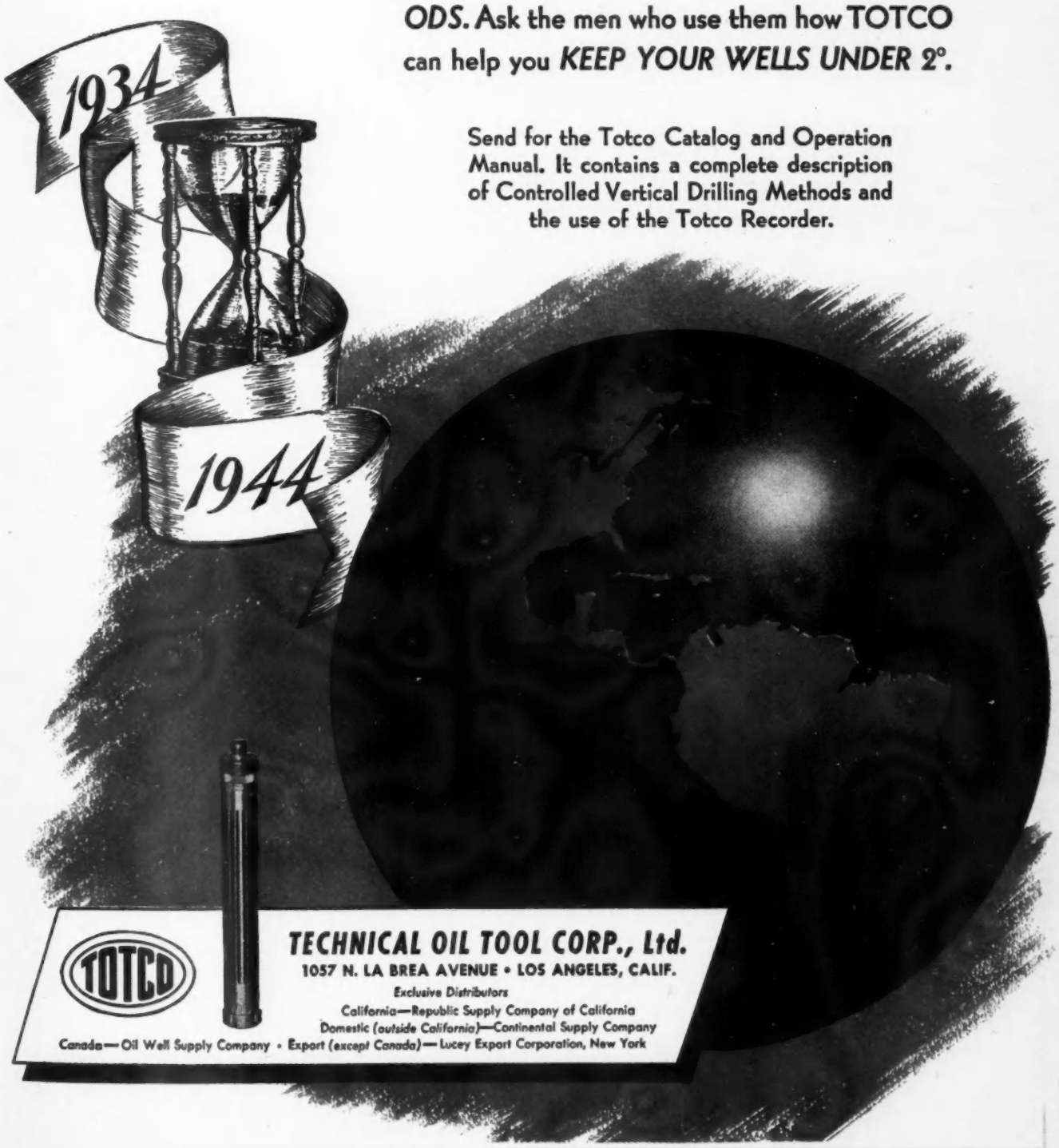

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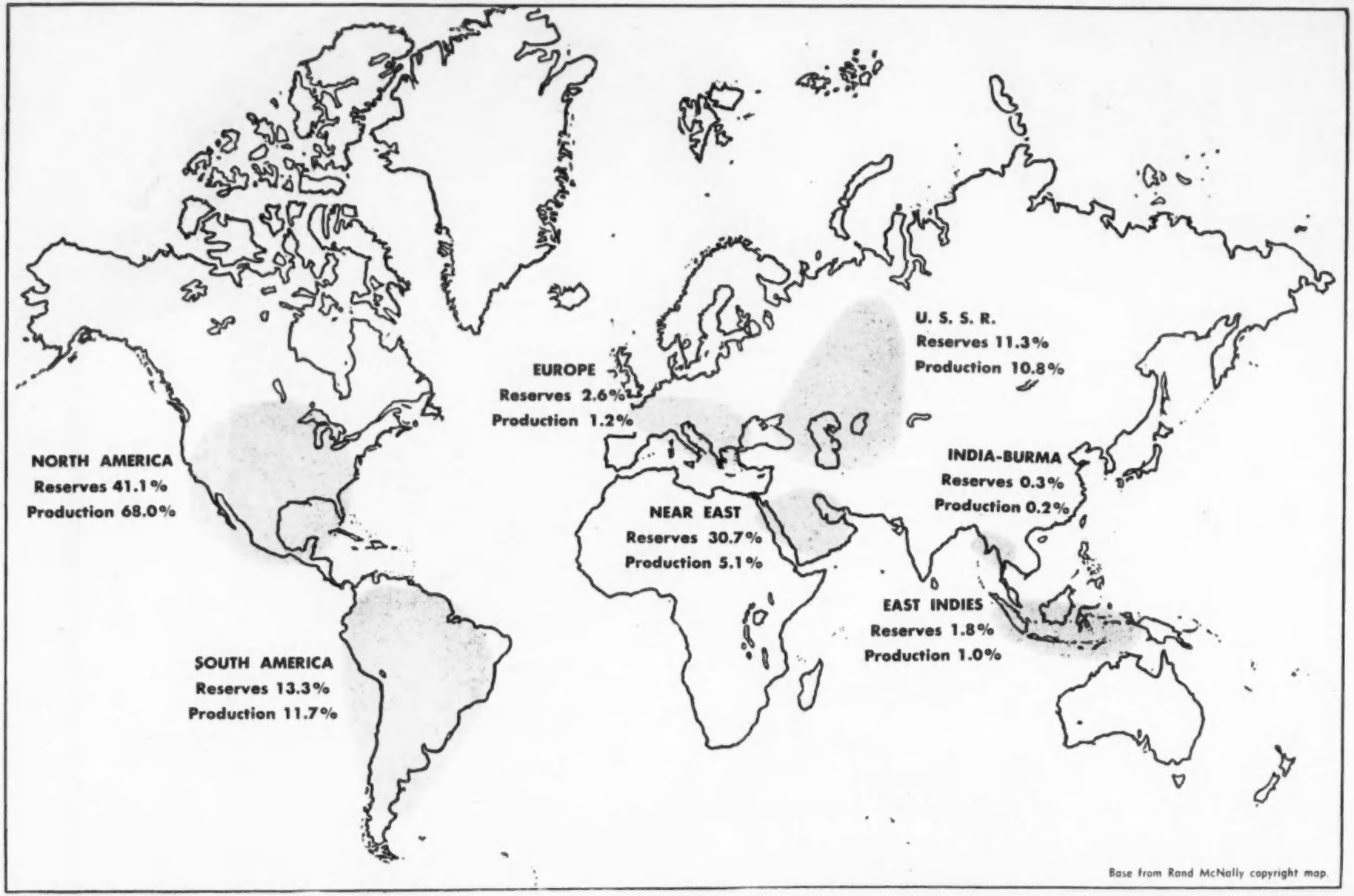

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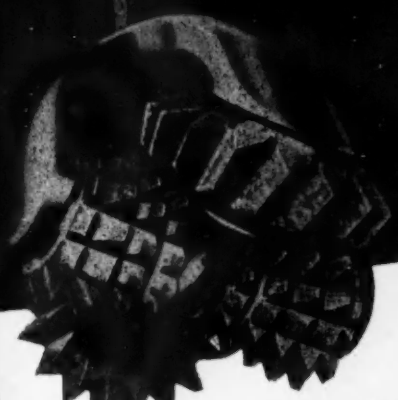

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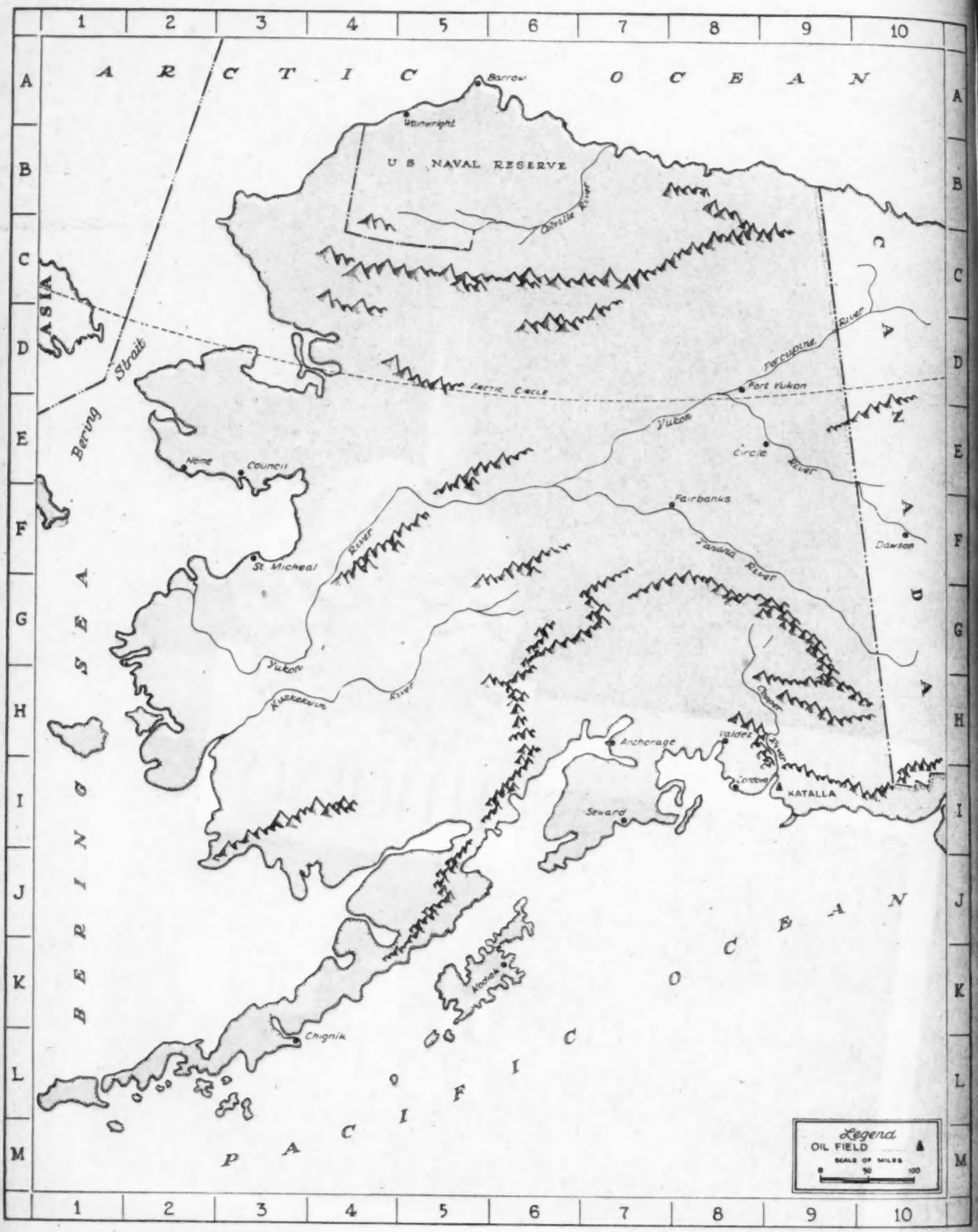
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Porcupine River
Fort Yukon
Yukon
Circle
Yukon River
Nome
Council
Fairbanks
Tanana River
Dawson
St Micheal
Yukon
Kuskokwim River
Anchorage
Valdez
Copper River
Cordova
KATALLA
Seward
Kodiak
Chignik
BERING SEA
PACIFIC OCEAN
CANADA
Legend
OIL FIELD
SCALE OF MILES
50
100
1 2 3 4 5 6 7 8 9 10
A B C D E F G H I J K L M

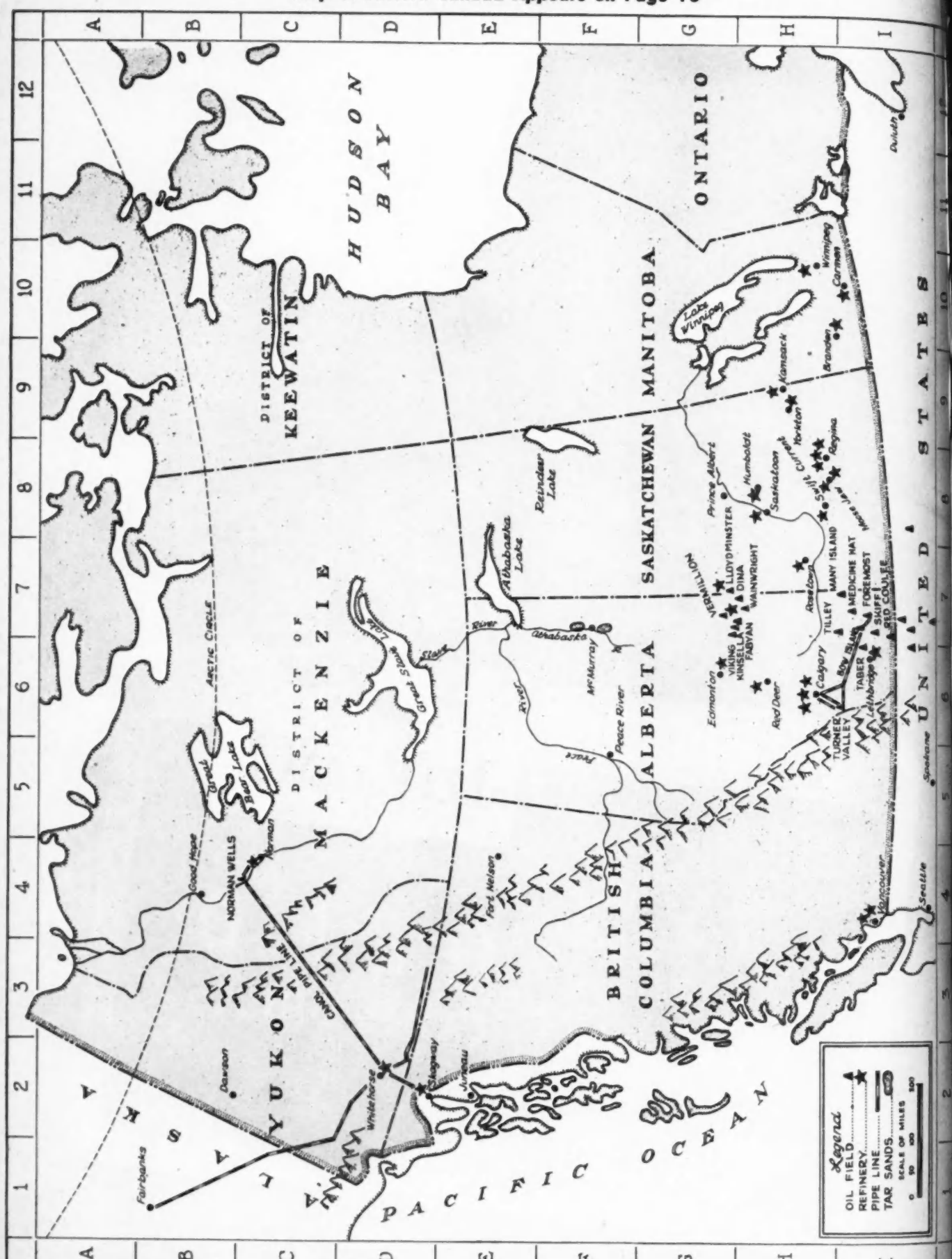
FOR HIGHEST EFFICIENCY

REED
CORE DRILLS

REED ROLLER BIT COMPANY

CANADA, Western Half

Map of Eastern Canada Appears on Page 10



FOR HIGHEST EFFICIENCY

REED

REED ROLLER BIT COMPANY

CANADA, Eastern Half

Map of Western Canada Appears on Page 8

FOR HIGHEST
EFFICIENCY
REED
TOOL JOINTS
REED ROLLER BIT COMPANY

MEXICO

UNITED STATES
Gulf of Mexico
PACIFIC OCEAN
GUATEMALA
HONDURAS
BR. HONDURAS
Southern Tampico Fields
Northern Tampico Fields
Isthmus Fields
SAN LUIS POTOSI
VERA CRUZ
HIDALGO
PUEBLA
TABASCO
CHIAPAS
OAXACA
TAMPAULIPAS
Legend
OIL FIELD
REFINERY
PIPE LINE
SCALE OF MILES

THERE'S A SIZE FOR EVERY JOB

Unit pictured is the A-80-TC with a structure rating of 7,500 API pounds. Three other sizes, two larger and one smaller are also available. Prime mover may be electric motor, single or multi-cylinder gas or gasoline engine.

Self-contained, unit-type skid base makes field transportation and installation easy; gives maximum strength with minimum weight; eliminates necessity of expensive foundation.

Weatherproof construction minimizes need for housing. Helical gearing and Timken-equipped, double reduction reducer provides high mechanical efficiency. Has Shafer self-aligning roller bearings on wrist pin and equalizer. Arc-type hanger gives straight polished rod lift and permits tipping back for servicing.

Effective balancing obtained with master and auxiliary crank weights. Stroke lengths and pumping speeds are adjustable. All bearings and working parts easily accessible for inspection and lubrication. Reliable brake stops and holds load in any position.

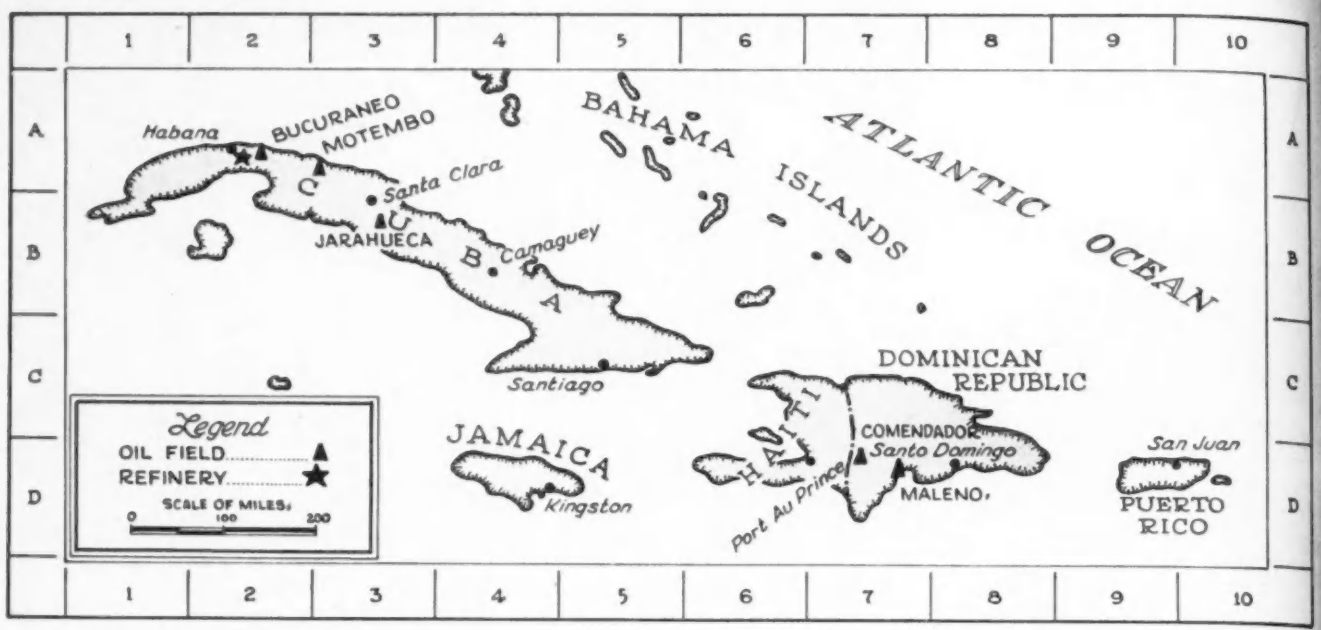
A-80-TC Specifications

Unit Structure Rating, API, pounds	7,500
Unit Gear Peak Torque Rating, API, inch pound	44,550
Reduction Unit Ratio	28.4:1
Range of Polished Rod Strokes, inches	22"–26" 30"–36"
Maximum Counterweight Effect at Maximum Polished Rod Stroke, pounds	4,523
Pitch Diameter of V Belt Sheave	16.6"–4B
Walking Beam Size and Weight	12"–28lb.CB
Well End Working Centers, inches	48
Weight of Master Crank Weights per pair, pounds	310
Weight of Auxiliary Crank Weights per pair, pounds	220
Weight of Beam Weights each, pounds	120
Total Weight of Unit, less Beam Weights and Engine, pounds	3,530

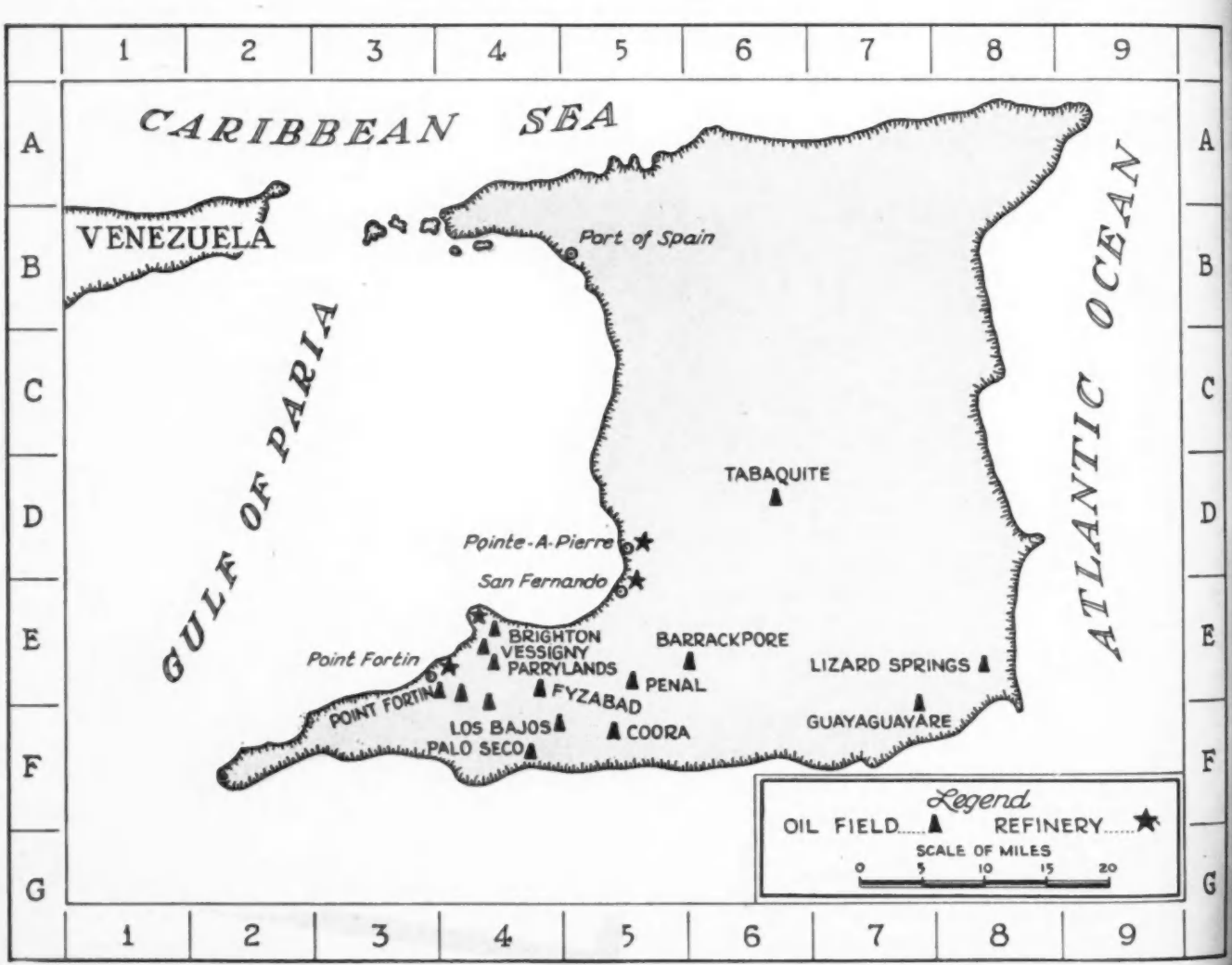
SEND FOR SPECIFICATIONS OF SMALLER AND LARGER UNITS

ALTEN'S
FOUNDRY and MACHINE WORKS
Established 1889 LANCASTER, OHIO
Write Us Direct for Catalogue
Leading Supply Stores Carry All Alten Oil Field Equipment

CUBA



TRINIDAD



Ready to Go Anywhere

Jack Ammann photogrammetric engineers are ready to go anywhere to meet oil industry needs . . . to produce accurate, precise maps and aerial surveys.

The Jack Ammann organization is the only one in the South producing CONTOUR MAPS by Multiplex methods. Consult us for: PRECISE AERIAL SURVEYS—REPRODUCTIONS—LAND SURVEYS—REGIONAL AND FEE MAPS.

JACK AMMANN

PHOTOGRAMMETRIC ENGINEERS

FORMERLY KARGL AERIAL SURVEYS

829-31 N. ST. MARY'S ST. SAN ANTONIO 2, TEXAS

ARGENTINA

Legend
OIL FIELD
REFINERY
SCALE OF MILES
BOLIVIA
PARAGUAY
BRAZIL
URUGUAY
ATLANTIC OCEAN
PACIFIC OCEAN
CHILE
ARGENTINA
SAN PEDRO
TARTAGAL
LOMITAS
TRANQUITAS
AGUA BLANCO
PESCADO
JUJUY
YUTO
MORALITO
Salta
LOS ANDES (Ter.)
Antofagasta
Taltal
TUCUMAN
Tucuman
SANTIAGO DEL ESTERO
Santiago del Estero
CATAMARCA
LA RIOJA
La Serena
SAN JUAN
San Juan
San Felipe
Valparaiso
Santiago
ACHEUTA
LUNLUNTA
BARRANCAS
TUPUNGATO
TUNUYAN
SOSNEADO
Curico
MENDOZA
Chillan
SAN LUIS
Cordoba
CORDOBA
EL CHACO (Ter.)
FORMOSA (Ter.)
Pilcomayo River
Paraguay River
Paraguay
Parana River
MISIONES (Ter.)
CORRIENTES
Parana
Uruguay
SANTA FE
Santa Fe
La Paz
ENTRE RIOS
Rosario
Buenos Aires
Montevideo
BUENOS AIRES
Bahia Blanca
LA PAMPA (Ter.)
NEQUEN (Ter.)
PORTEZUELO
PLAZA HUINCUL
CHALLECO
Valdivia
RIO NEGRO (Ter.)
Rawson
CHUBUT (Ter.)
COMODORO RIVADAVIA
Comodoro Rivadavia
0-12
SANTA CRUZ
Cape Curioso
Rio Chico
See Southern Continuation
SOUTHERN CONTINUATION
Cape Curioso
Rio Chico
Puerto Sta. Cruz
SANTA CRUZ
Rio Gallegos
Magallanes
TIERRA DEL FUEGO (Ter.)
Ushuaia

NOHEEV* *(Silicate of Soda)*

Facilitates Drilling Heaving Shale and Other Difficult Formations

NOHEEV, newest member of the Magcobar family of drilling mud products, is a specific aid in drilling heaving shale, high pressure gas and salt water flows, salt overhangs and similar troublesome formations. It has been used with conspicuous success on numerous operations in heaving shale zones and has proved conclusively that its use effectively prevents swelling, sloughing, and hydrous disintegration of even the most reactive colloidal shales. Unlike conventional water-base muds, Noheev muds are not adversely affected by salt water, high temperatures or by contaminants usually associated with high pressure gas and salt water flows.

Operators who are concerned with these drilling problems are invited to consult with our engineering staff on the applications and details of Noheev.

* Manufactured by Philadelphia Quartz Co., Patent No. 2133759
Trade-Mark Registered U. S. Patent Office

MAGNET COVE BARIUM CORPORATION

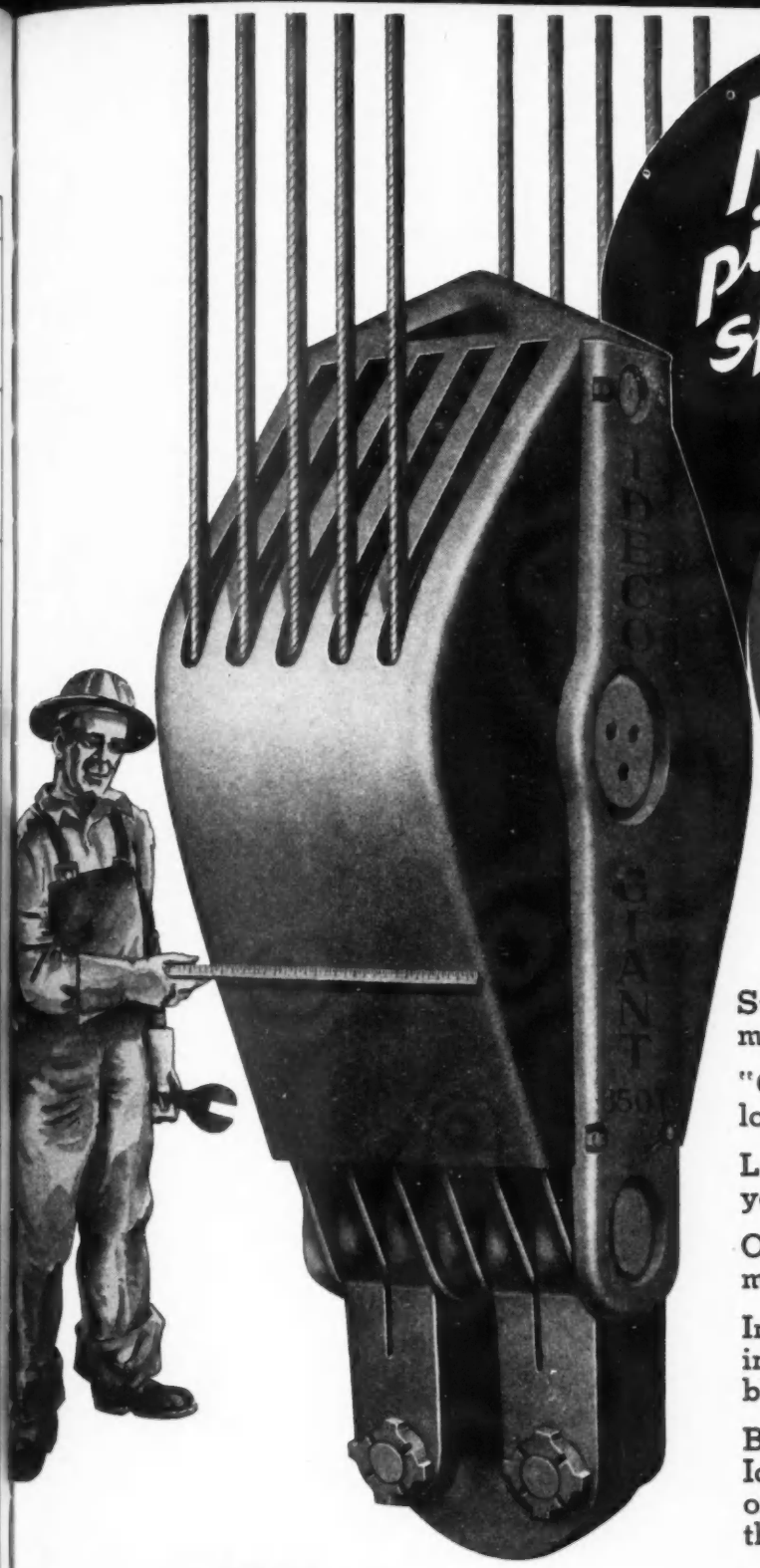
MALVERN, ARKANSAS HOUSTON, TEXAS

MAGCOBAR BARITE • MAGCOGEL BENTONITE • XACT DRILLING CLAY • HIGH YIELD DRILLING CLAY
MAGCOFIBER • MAGCOMICA • MAGCOFLAKE • NOHEEV • CHEMICALS

BOLIVIA

BOLIVIA FIELD GUIDE

Country and Field	Map Guide	Year Found
Bermejo	I-5	1927
Buena Vista	H-6	1926
Caigua	H-6	....
Camatindi	H-6	1929
Camiri	G-6	1927
Caupolican	D-2	....
Chapare	D-5	....
Espejas	F-6	....
Guariri	G-6	....
Isiboro	D-4	....
Machareti	H-6	....
Sanandita	H-6	1926
Saipuru	G-6	1924
San Telmo	I-5	....
Tartendo	G-6	1928



MORE pipe racking space because this new IDECO GIANT traveling BLOCK is the narrowest 350 TON BLOCK You can Buy.

ONLY 28 3/4" WIDE

Streamlined construction assures free movement past the drill pipe.

"Over-balanced" design permits greater lowering speeds.

Large (48 inch) alloy steel sheaves give you longest wire rope life.

Oversize alloy steel pin provides wide margin of safety.

Interchangeability of sheaves and bearings in companion crown and traveling blocks facilitates maintenance.

Buy this new Giant Traveling Block at Ideco stores or at your nearest Ideco sales office. It speeds your drilling and prolongs the life of your wire rope -- at no extra cost.

More new Ideco products coming ... Watch for them.

INTERNATIONAL DERRICK & EQUIPMENT COMPANY

Sales Offices - Eastern: Columbus 8, Ohio; Mid-Continent: Dallas 1, Texas; Pacific Coast: Los Angeles 13, California; Export: 122 East 42nd. St., New York 17, N. Y.; Sales Offices and Stores in All Active Oil Fields.

IDECO

ONE OF THE DRESSER INDUSTRIES

BRAZIL

Legend
OIL FIELD
REFINERY
SCALE OF MILES
VENEZUELA
BRITISH GUIANA
Paramaribo
FR. GUIANA
Cayenne
NETH. GUIANA (SURINAM)
ININI (FR.)
Negro River
Solimões River
Manaus
Amazon River
Western Continuation
AMAZONAS
Purús River
Santa Helena
PARA
Boa Vista
MARANHAO
CEARA
RIO GRANDE DO NORTE
PARAHYBA
Recife
PERNAMBUCO
ALAGOAS
Maceió
SERGIPE
PIAUHY
MATO GROSSO
GOYAZ
CANDEIS
BAHIA
LOBATO
Arassuahi
BOLIVIA
Sucre
MINASGERAES
ESPIRITO SANTO
Victoria
Ribeirao Preto
SAO PAULO
Sao Paulo
RIO DE JANEIRO
Rio De Janeiro
PARANA
SANTA CATHARINA
RIO GRANDE DO SIL
PARAGUAY
URUGUAY
ATLANTIC OCEAN
WESTERN CONTINUATION
VENEZUELA
Negro River
Purús River
Solimões
AMAZONAS
Santa Helena
Rio Branco
ACRE
PERU
BOLIVIA

SEE HOW PIPE AND CASING ARE PROTECTED

HERE is visible unretouched evidence of the vital role which Patterson-Ballagh Casing Protectors play in the war against wear. The center stand is unprotected. Tool joint wear is readily seen. This means the casing, too, is taking a beating. Tool joints of the other stands show no abrasion as evidenced by the many tong marks.

The smaller photograph shows balance of the same string, all with lipped Protectors, and all well protected, *except* for that *one* maverick, first row, third from the left!

This string has just come out of the hole. Drill pipe and the floor beneath are clean as a whistle. This means only one thing—a Patterson-Ballagh Pipe Wiper has been at work.

Patterson-Ballagh Products are now made of PBX synthetic rubber—a development which has meant added resistance to oil and weather.

Note wear on the stand third from left... Others are clearly protected with Patterson-Ballagh Protectors.

PATTERSON-BALLAGH

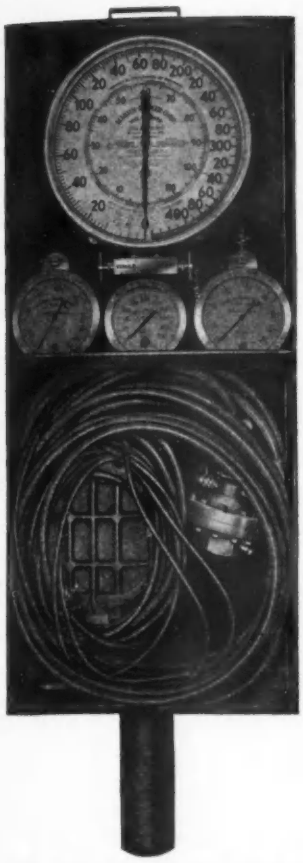
LOS ANGELES 1 • HOUSTON 10 • NEW YORK 6

100% Protection Means a Patterson-Ballagh Protector at *EACH Joint*

COLOMBIA

Legend
OIL FIELD
REFINERY
PIPE LINE
Scale of Miles
CARIBBEAN SEA
ARUBA
BONAIRE
CURACAO
LAGOAJIRA
Barranquilla
Santa Marta
ATLANTICO
Cartagena
MAGDALENA
Calamar
Caracas
Lake Maracaibo
EL DIFICIL
Carmen
Covenas
Santa Ana
SOUTH AMERICAN
ANDEAN PIPE LINE
PANAMA
RIO DE ORO
LOS MAUELES
RIO TARRA
LA PETROLEA
BOLIVAR
La Gloria
Convencion
TIBU
VENEZUELA
SANTANDER
DEL NORTE
Cucuta
Puerto Wilches
Barranca Bermeja
Bucaramanga
CASABE
CIRA
INFANTAS
ANTIOQUIA
SANTANDER
ARAUCA
Medellin
Quibdo
BOYACA
Tunja
CALDAS
Manizales
Bogota
CUNDINAMARCA
VICHADA
Meta
TOLIMA
Ibague
VALLE DEL CAUCA
Cali
Neiva
META
Guaviare
Popayan
CAUCA
HUILA
VAUPES
NARINO
CAQUETA
PUTUMAYO
Putumayo
Apaporis River
AMAZONAS
PACIFIC OCEAN
ECUADOR
PERU
BRAZIL
Marañon River

These MARTIN-DECKER INSTRUMENTS Cover Every WEIGHT CONTROL NEED



MARTIN-DECKER instruments accurately *control* weights, pressure, speeds and other important drilling factors to insure maximum hole per dollar! And they will fit right in with your current development program, whatever your requirements may be. Put them to work on your wells . . . *they'll prove the most valuable aid you can find to slice drilling costs.*

THE "SEALTITE"—The master control instrument for every job where you want full drilling information. Indicates and records weight, mud pressure, torque, and shows rotary table speed. Completely closed and sealed fluid system. Entirely self-contained and easy to install. Illuminated for easy night reading. Has capacity to handle 20,000 foot wells. Gauge readings are smooth, sensitive — always accurate. Available with metric dials if desired.

THE CLIPPER—A portable weight indicator for ordinary drilling or production work. Has vernier gauge for extremely sensitive weight control when fishing, milling, etc. Light weight eliminates tendency to swing on the deadline in rough drilling.

THE UNITIZED MUD PUMP GAUGE

Accuracy, sensitivity and smooth, easy readings make this the ideal portable gauge for measuring slush pump pressures. Mechanism runs in an oil bath, eliminating rust or corrosion. Large numerals stand out clearly from 30 feet or more, and readings can be made by simply noting position of gauge hand. Vernier retard movement covers both low and high pressure ranges. Unitized is available in one, three or five thousand pound capacities.

THE SLIM HOLE—For shallow field and core testing work not exceeding weights of 150,000 pounds with six lines. Built-in diaphragm unit gives extreme compactness and portability. Use of full dial circumference for numerals insures complete legibility from driller's position. No shims required for attaching instrument to different sized lines.

THE DRILLOGGER—When the war is over you'll want to own the instrument that provides all the needed data in the most visible permanent form. The Drillogger places right before the driller—on a single strip chart—a record of weight on bit, table speed, mud pressure torque on drill pipe, and rate of penetration. With such a true picture of all the hole-making functions constantly before him, it is easy for the driller to work out the best combination for efficient operation.

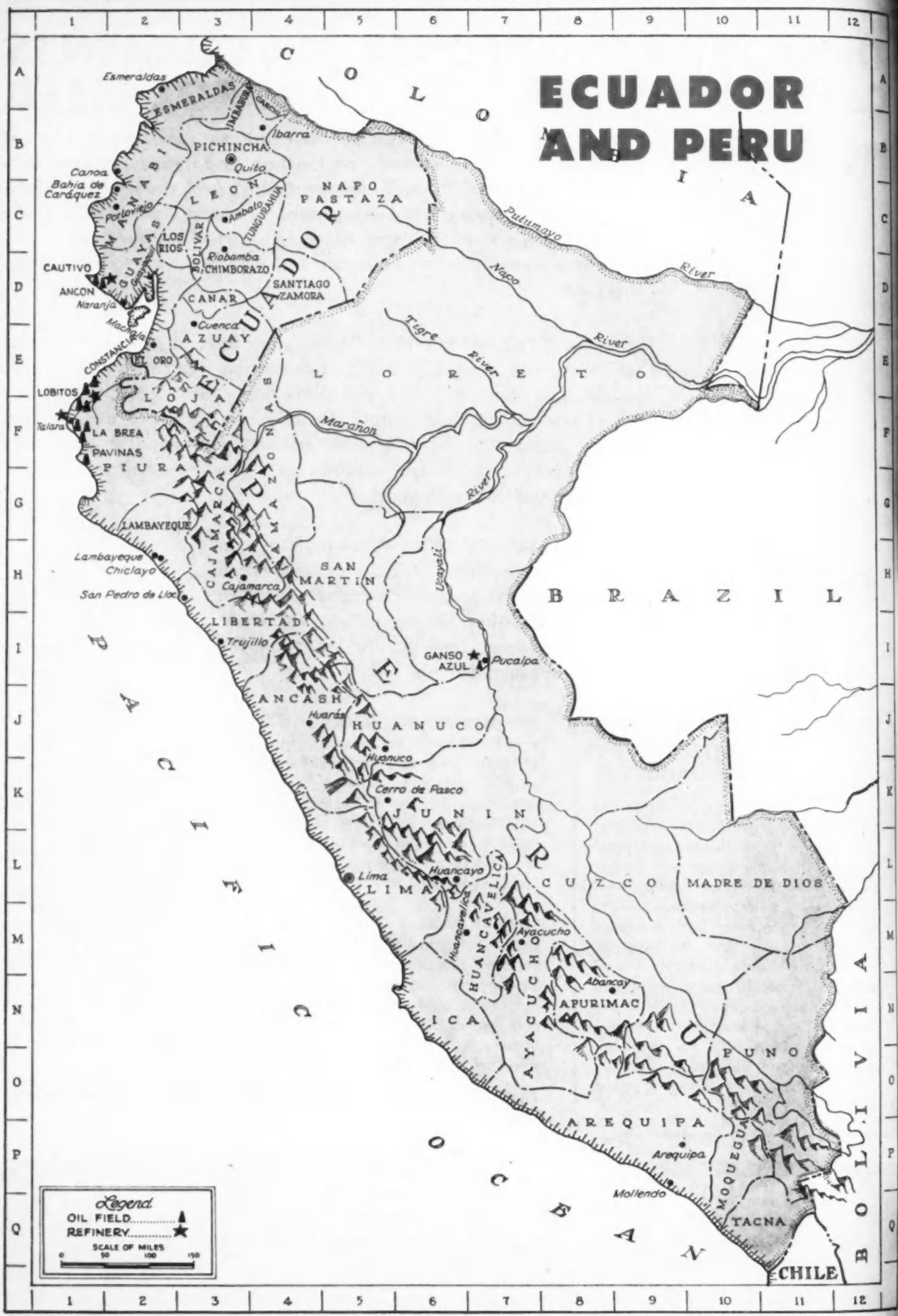
There is a Martin-Decker instrument to meet every weight control need!

HOME OF THE WEIGHT INDICATOR

MARTIN DECKER CORP.

LONG BEACH, CALIFORNIA

SAN JOAQUIN VALLEY: A. F. McQUISTON, BAKERSFIELD, CALIFORNIA
MID CONTINENT DISTRIBUTOR: REED ROLLER BIT COMPANY, HOUSTON, TEXAS


ECUADOR AND PERU
COLOMBIA
Esmeraldas
ESMERALDAS
MANABI
CARCHI
IMBABURA
Ibarra
PICHINCHA
Quito
Canoa
Bahia de Caráquez
Portoviejo
LEON
NAPO PASTAZA
Ambato
TUNGURAHUA
GUAYAS
LOS RIOS
BOLIVAR
Riobamba
CHIMBORAZO
Putumayo River
Napo River
CAUTIVO
ANCON
Naranja
Machala
SANTIAGO ZAMORA
CANAR
Cuenca
AZUAY
CONSTANCIA
EL ORO
ECUADOR
Tigre River
LORETO
LOBITOS
Talara
LOJA
LA BREA
PAVINAS
PIURA
Marañon River
AMAZONAS
CAJAMARCA
LAMBAYEQUE
Lambayeque
Chiclayo
San Pedro de Lloc
Cajamarca
SAN MARTIN
Ucayali River
BRAZIL
LIBERTAD
Trujillo
GANSO AZUL
Pucalpa
ANCASH
Huarás
HUANUCO
Huanuco
Cerro de Pasco
JUNIN
PACIFIC OCEAN
Lima
LIMA
Huancayo
CUZCO
MADRE DE DIOS
Huancavelica
HUANCAVELICA
Ayacucho
AYACUCHO
Abancay
APURIMAC
ICA
PUNO
AREQUIPA
Arequipa
MOQUEGUA
Mollendo
TACNA
BOLIVIA
CHILE
Legend
OIL FIELD
REFINERY
SCALE OF MILES
0 50 100 150

This is a very important time to be sure that any tools or equipment you use have been proved to be . . .

Practical & Dependable

BAKER OIL TOOLS INC.
BAKER
SERVING THE WORLD
Product No. 101 Float Collar
Product No. 121 Wash-Down Whirler Guide Shoe
Product No. 100 Float Shoe
Product No. 102 Guide Casing Shoe
Product No. 120 Wash-Down Whirler Float Shoe
Product No. 306 Metal Petal Basket
Product No. 590 Well Scraper
Product No. 480 Drill Pipe Float
Product No. 620 Casing Scraper
Product No. 910 Casing Centralizer
Product No. 400 Cement Retainer
Product No. 550 Kelly Straightener

for your copy of 1944 BAKER ALOG.

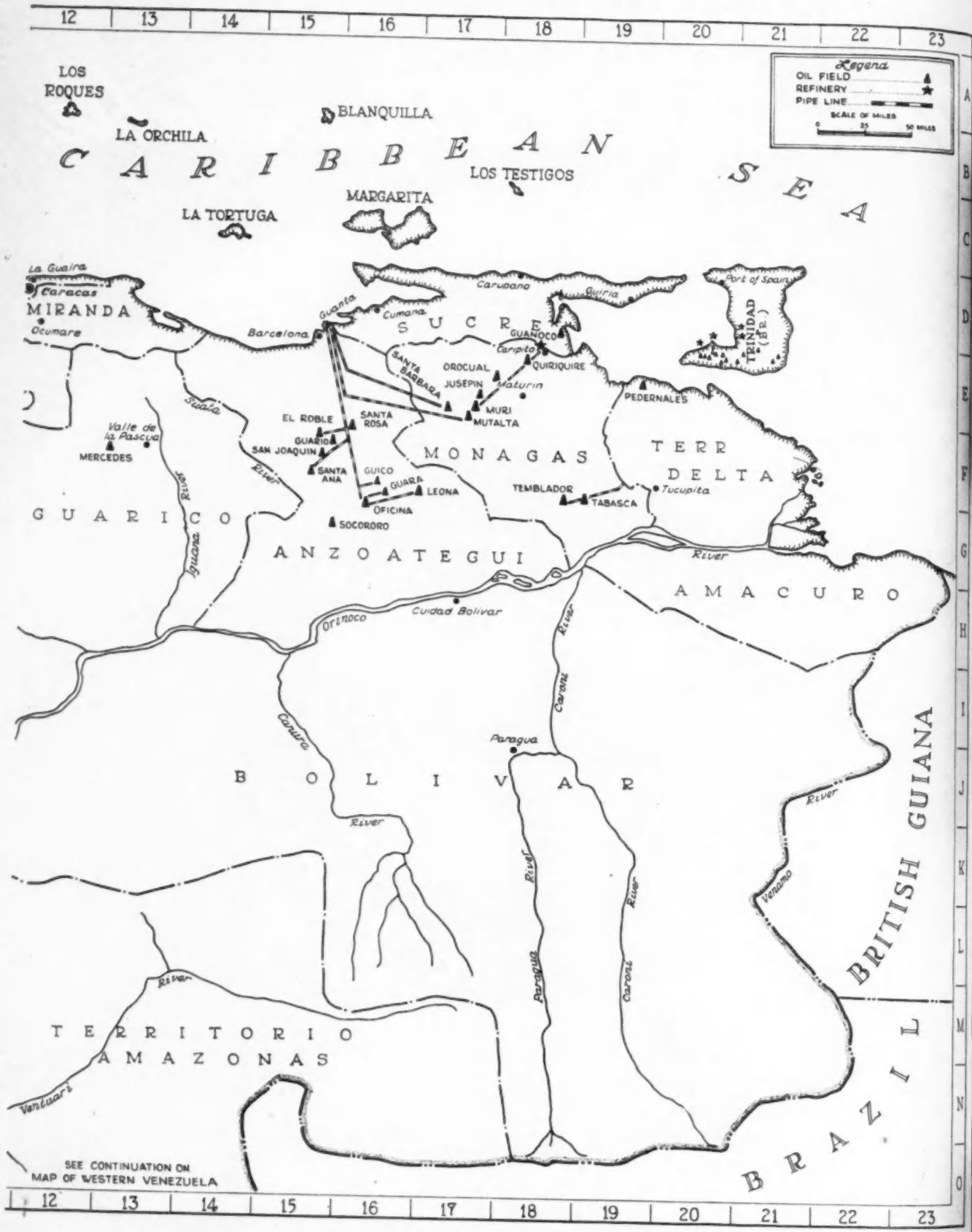
Look on Pages 303 to 378—1944 Composite Catalog.

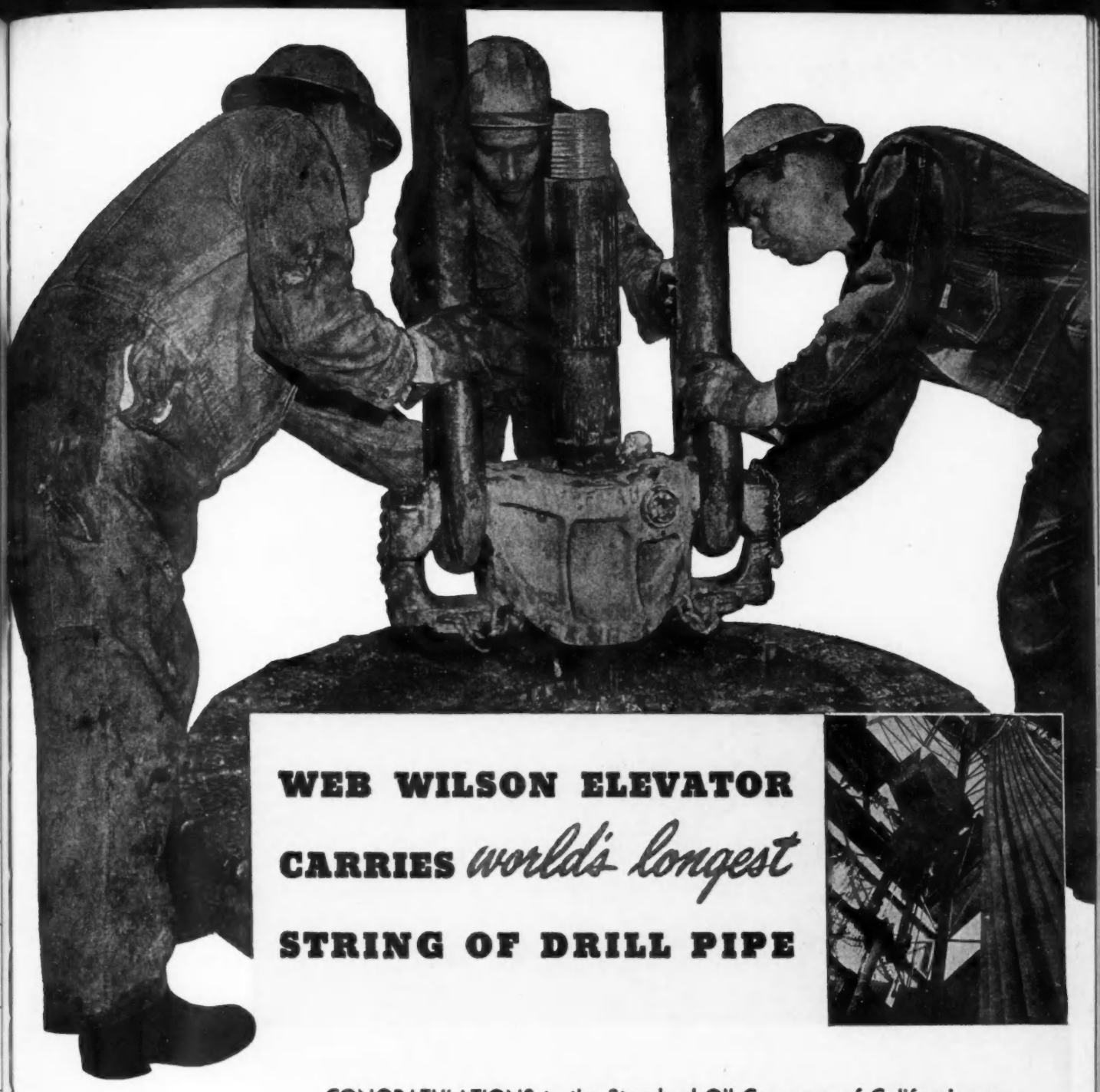
BAKER OIL TOOLS, INC.

Houston • LOS ANGELES • New York

VENEZUELA, Eastern Half

See Page 28 for Western Half





WEB WILSON ELEVATOR CARRIES *world's longest* STRING OF DRILL PIPE

CONGRATULATIONS to the Standard Oil Company of California on the perfected drilling technique responsible for attaining the world's record depth.

WEB WILSON, the designer of the FIRST elevator to handle upset drill pipe, supplied the elevator that today carries the world's longest string of drill pipe.

WEB WILSON PRODUCTS: Elevators for Collar and External Upset Drill Pipe and Tubing; Rotary and Casing Tongs, Tong Pins, Tong Dies; 100-Ton and 500-Ton Connectors.

WEB WILSON *Oil Tools*

WEB WILSON OIL TOOLS
W. W. Wilson Building
HUNTINGTON PARK, CALIFORNIA

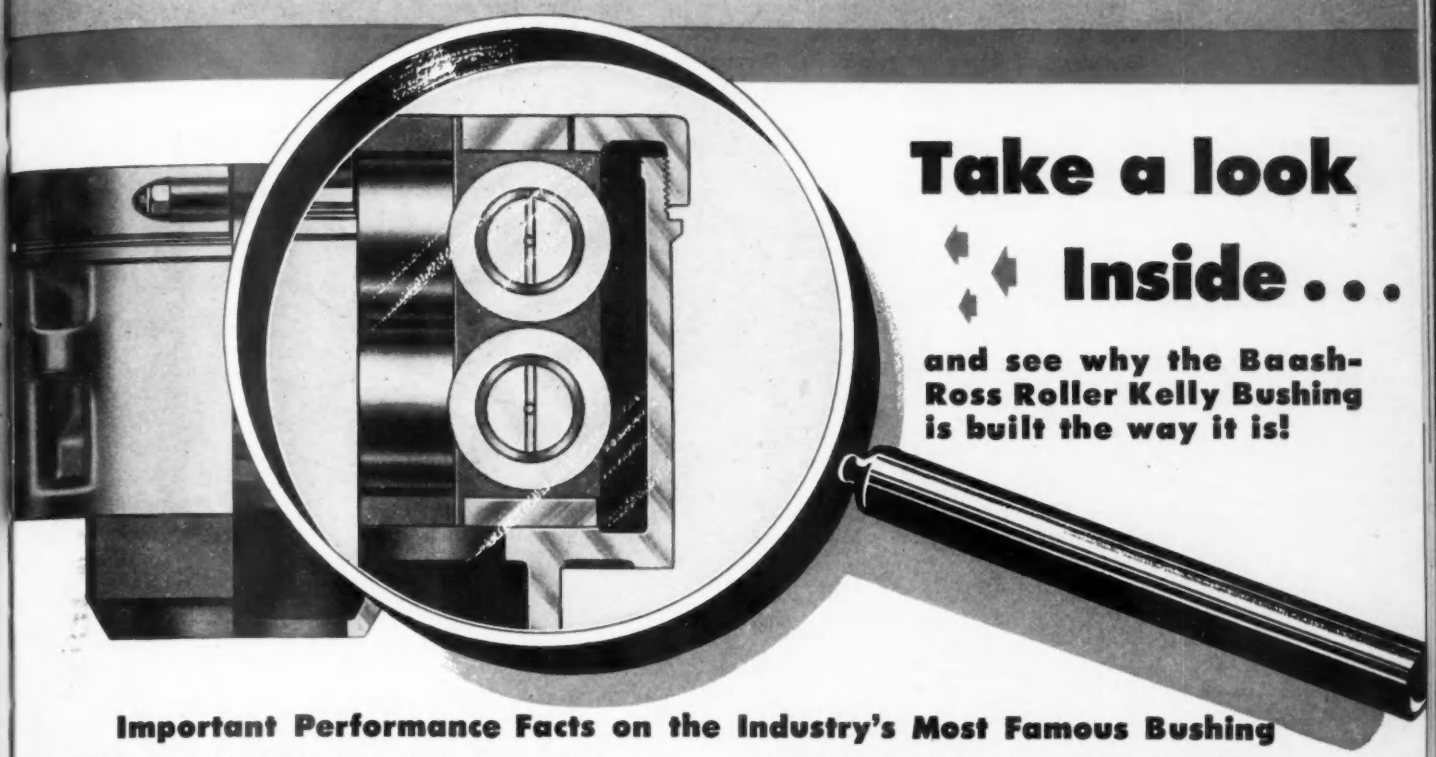
VENEZUELA, Western Half

See Page 26 for Eastern Half

Baash-Ross News

BAASH-ROSS TOOL COMPANY · LOS ANGELES · HOUSTON · NEW YORK

OIL WEEKLY EDITION



Take a look Inside...

and see why the Baash-Ross Roller Kelly Bushing is built the way it is!

Important Performance Facts on the Industry's Most Famous Bushing

Baash-Ross Roller Kelly Bushings are setting such outstanding performance records wherever they are in service that a constantly increasing number of oil men are asking for more information on the "fine points" of roller bushing design. The following are typical of questions we are frequently asked in the field. Perhaps your question is answered here. If not, our engineering department will be glad to explain to you the engineering "why" of any point you wish to ask about.

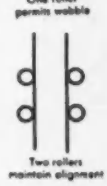
Q Why use *two* rollers in contact with each kelly face? Wouldn't one large roller on each face serve as well?

A. Definitely not. Two rollers give vertical stability to the kelly—prevent it from gyrating and wobbling—hold it steady at *all* table speeds and under *all* drilling conditions, rough or smooth.

One roller on each face would not give this vertical stability . . . would permit the kelly to wobble and gyrate over a wide arc—which, in turn, would not only reduce drilling speed and efficiency, but would also cause severe strains on table bearings, swivel bearings and pipe connections.

Another important point—one roller for each face would necessitate the rollers being quite large in order to prevent "corrugating" the kelly. Large rollers mean high inertia—are slow to start, slow to stop and prevent instant response to kelly feed. But by using two rollers against each face, ample driving surface is secured with rollers that are compact, quick-turning, quick-stopping. Result—*instant response to the most delicate bit feed!*

One roller permits wobble



Two rollers maintain alignment

Q Why do you use a bronze bushing between each roller and pin? Wouldn't it be easier to simply use larger pins and eliminate the bronze bushings?

A. It would be easier, yes . . . but not good engineering. The bronze bushings serve a very important function by preventing steel-to-steel contact between rollers and pins. As most engineers know, steel against bronze gives a much better bearing surface than steel-on-steel. It not only resists galling under higher loads, but also carries more efficiently the heavy driving pressures set up between the pins and rollers.

And speaking of the pins, here's another valuable design feature . . . Because there is no pressure (therefore no wear) on the back side of the pins, these have been designed so that they can be easily reversed to bring the unworn back side to the front for additional life after the front sides are worn. Cuts maintenance to a minimum and insures peak performance *longer* without replacements.

Bronze bushing prevents steel-to-steel contact

Q Do you need a separate Baash-Ross Roller Bushing for each size kelly?

A. No. The same bushing can be quickly changed from one kelly size to another by merely lifting out the roller assemblies—which come in sets—and replacing them with a new set of the desired size. It's simple, fool-proof, *quick* . . . and cuts kelly bushing investment to a minimum.

For example, the same Baash-Ross Bushing will fit *all* square kelly sizes from 3½" to 6" by simply changing roller assemblies. Or, when using Hex kellys, the same Roller Bushing will fit all Hex sizes from 4¼" to 7" by changing only the assemblies.

Q It's a well-known fact that close bushing fit is important when using Hex kellys. Can you maintain close fit with the Baash-Ross Roller Bushing for Hex kellys?

A. Absolutely! In fact, the Baash-Ross Hex Roller Kelly Bushing is designed so that all you do to adjust the fit is lift out the roller assemblies and remove one or more shims below each assembly. Working diameter is reduced exactly 1/32" for each shim removed, so it's easy to make accurate adjustment without complicated operations.

Get the complete story on Baash-Ross Roller Kelly Bushing advantages before you invest in any bushing. Your near-by Baash-Ross representative will be glad to supply further details on this modern bushing—or write direct for full information.

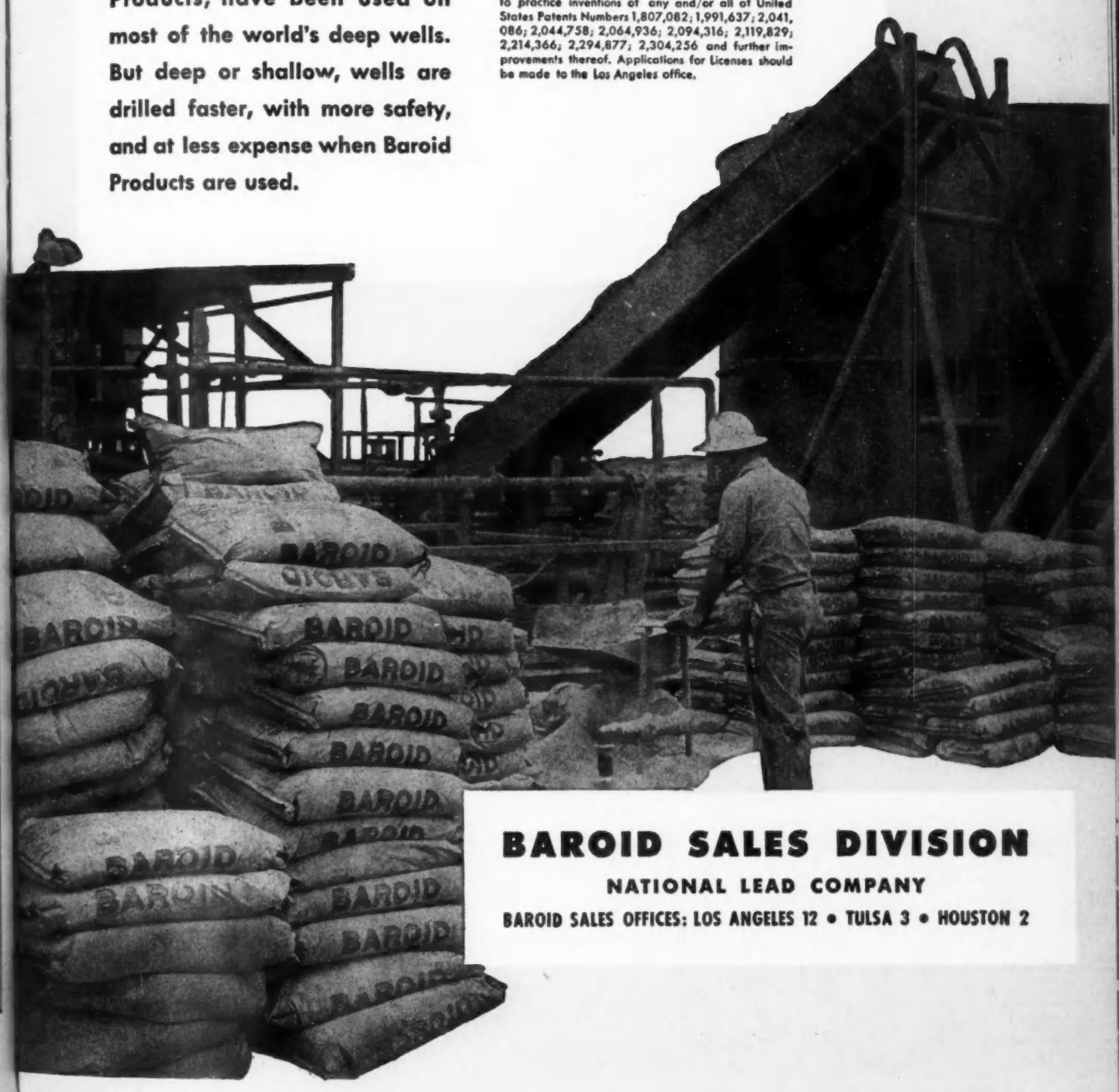
GERMANY, AUSTRIA and NORTHEAST FRANCE

Boundaries shown for Germany, Austria and France, as for all European countries, are prewar boundaries. Due to wartime censorship, it is not known how many German refineries may have been destroyed. Neither is information available on new construction. Therefore, no attempt has been made to show a complete list of refining plants. The refineries shown represent the principal prewar refining centers. Incomplete information through 1940 indicates several new fields had been discovered in Germany, and it was not possible in all cases to locate them.

BAROID HELPS DRILL WORLD'S DEEPEST WELL

The management and personnel of the Standard Oil Company of California are to be congratulated on drilling the world's deepest well. We are pleased that BAROID played a part in this record achievement. BAROID, and other Baroid Products, have been used on most of the world's deep wells. But deep or shallow, wells are drilled faster, with more safety, and at less expense when Baroid Products are used.

PATENT LICENSES, unrestricted as to sources of supply of materials, but on royalty bases, will be granted to responsible oil companies and operators to practice inventions of any and/or all of United States Patents Numbers 1,807,082; 1,991,637; 2,041,086; 2,044,758; 2,064,936; 2,094,316; 2,119,829; 2,214,366; 2,294,877; 2,304,256 and further improvements thereof. Applications for Licenses should be made to the Los Angeles office.



BAROID SALES DIVISION

NATIONAL LEAD COMPANY

BAROID SALES OFFICES: LOS ANGELES 12 • TULSA 3 • HOUSTON 2

BAROID PRODUCTS — KINHYDROX • AQUAGEL • AQUAGEL CEMENT • BAROCO • BAROID • FIBROTEX • IMPERMEX MICATEX • SMENTOX • STABILITE • ZEOGEL • TESTING EQUIPMENT • BAROID WELL LOGGING SERVICE

CZECHOSLOVAKIA AND POLAND

Boundaries shown for Poland and Czechoslovakia, as for all European countries, are prewar boundaries. Due to wartime censorship, it is not known how many Polish refineries may have been destroyed, so no attempt has been made to show a complete list of refining plants. The refineries shown in Poland represent the principal prewar refining centers. Poland has numerous small oil fields, and many of those shown on this map represent more than one field, as shown in the index on page 2. The extreme western part of Czechoslovakia, which contains no oil fields, is shown on the map of Germany, page 30.

POLAND FIELD GUIDE

Country and Field	Map Guide	Year Found
Bialkowka	see Mecinka	....
Biecz	J-6	1887
Bitkow-Pasieczna	K-9	1899
Boryslaw	K-8	1862
Brzezowka	see Mecinka	....
Daszawa	K-9	1921
Dominikowice	see Koblanka	....
Duba	see Ryne	....
Harklowa	J-6	1874
Izdebhi	J-7	....
Jaszczow	see Mecinka	....
Klecany	J-5	1865
Koblanka	J-6	....
Komornik	see Ropianka	....
Kosmacz	L-9	1899
Krosno	see Mecinka	1888
Kroscienko	see Mecinka	1888
Kryg	see Koblanka	1885
Leszczowate	see Ropianka	....
Libusza	see Koblanka	1865
Majdan	see Bitkow	1880
Mecina	see Siary	....
Mecinka	J-6	1909
Mraznica	see Boryslaw	....
Opaka	J-8	1896
Pasczowa	J-7	....
Paszowa	see Ropianka	....
Potok	see Mecinka	1891
Rajskie-Polana	K-7	1886
Rolana	K-7	....
Ropa	see Siary	....
Ropica	see Siary	....
Ropienka	J-7	1885
Rosulna	see Bitkow	....
Rudawka Rymanowska	see Tokarnia	1899
Ryre-Duba	K-9	1887
Schodnica	K-7	1872
Siary	J-6	....
Sloboda	L-9	1771
Smereczna	see Ropianka	....
Stankowa	see Ropianka	....
Stara Sol	see Starzawa	....
Starzawa	J-8	....
Straziebice	see Starzawa	1880
Szymbark	see Siary	....
Tokarnia	J-7	1896
Toroszowka	see Mecinka	....
Trzesniow	see Mecinka	....
Tustanowice	see Boryslaw	....
Wankowa	see Ropianka	1865
Weglowka	J-7	1865
Wiesznia	see Ropianka	....
Wojtowa	see Haklowa	....
Wola Sekowa	see Tokarnia	....
Zagorz	J-7	1885
Zalawie (Korczyna)	see Biecz	....
Zmiennica	..	1896

HAMER

Plug Valves and Line Blinds have a long Record of Success in High Pressure Drilling, Producing & Pipe Line Service

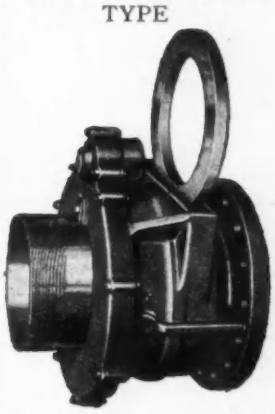
Hamer Round Opening Plug Valves provide a full round opening, eliminating bottlenecks in high pressure lines. The unrestricted fluid passage greatly reduces wear on the valve, resulting in longer service life and in substantial savings of maintenance cost. Readily adaptable to a wide range of high pressure applications, these plug valves are used on drilling rig manifolds, christmas trees, and other installations throughout the oil industry in all parts of the world. Although this is a pressure-balanced lubricated valve, the grease can be removed and the lubrication hole plugged when a non-lubricated valve is required. The Hamer line of plug valves includes many other types for a wide range of uses in field, refinery and the industry in general.

Round Opening Plug Valves

Geared and Not Geared Models — Sizes: 2", 2½", 3", 4".
Test Pressure—6000 pounds CWT

All-Steel Line Blinds

STANDARD GEARED TYPE



Blinds are in world-wide use on lines carrying gasoline, butane, propane, pressure distillate, kerosene, fuel oil and other fluids, on mud-pump suctions on drilling rigs, and in many services involving temperatures up to 250 degrees F. One man can change the line from full-open to full-closed and blinded position in less than one minute. Plate slot is enclosed, eliminating waste and fire hazard from spilling of the line fluid. All operating parts submerged in grease and securely packed off to prevent contamination of the line fluid. ASA 300-Pound flanges. All steel, or other materials if required. Sizes 2" to 12". Described on pages 1152 through 1157 of your 1944 Composite Catalog.

3-Bolt Line Blind

In this newest addition to the Hamer line of blinding equipment, designers of piping installations have available a low-cost, quick-operating line blind for use wherever a permanent, positive shut-off is required. Turning only *three* nuts, easily done by *one man* with a bar, quickly spreads or tightens the flanges. The use of a long bar in turning the nuts gives tremendous leverage, insuring a tight, positive seal between packing and plate. Bar operated bolts eliminate wedges, hammers and wrenches preventing the fire hazard of sparking. Once you have installed Hamer Line Blinds you will realize that they soon repay their cost in savings of time and labor. Available in all popular sizes, with Series 150 or Series 300 flanges. Other flanges available. Write for the new Hamer Catalog of Line Blinds and bulletin giving prices and engineering data on 3-Bolt Line Blinds.

HAMER OIL TOOL COMPANY
2919 GARDENIA AVENUE
LONG BEACH 7, CALIFORNIA

ALBANIA, GREECE, ITALY AND YUGOSLAVIA

Boundaries Shown Are Prewar Boundaries

GULFCO

GULFCO (Martois) LOW PRESSURE CROSS FIRE GAS BURNER
(Patented)

Gives the Same Efficiency from Low Pressures as from High Pressures

ELIMINATES ALMOST 100% THE STACK BLOWER PROBLEM

Gives Maximum Boiler Capacity on From 1 to 2 Pounds Gas Pressure

The combustion is so complete that forced draft is not necessary to obtain the required b.t.u.'s from low pressures. The Gulfco Burner burns 80% of the gas as against 60% of conventional burners.

Combustion takes place at a lower pressure because the proper homogeneous mixture of gas and air is attained quickly through a unique multi-jet system.

Each riser has 4 separate jets. On a 40-burner assembly you get 160 separate mixers and on a 45-burner assembly, 180 mixers.

Long Lasting . . . Ruggedly Constructed

All risers and mixer castings are high grade, heat-resisting burner metal.

The burner is compact, being about 7½" to 8" high and weighing approximately 410 pounds on a 45-burner assembly and 350 pounds on a 40-burner assembly.

All space not taken up by the burner is closed by plates.

Manifold is completely tested for leaks before shipping.

REMARKABLE FUEL SAVER

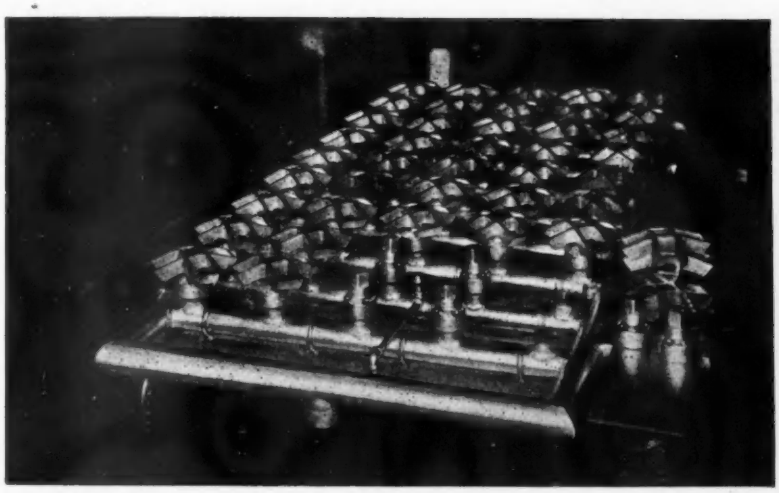
The complete combustion attained from the multi-jet system together with a controlled draft system naturally makes for a big saving in fuel. Tests prove this fuel saving to be 15% or more.

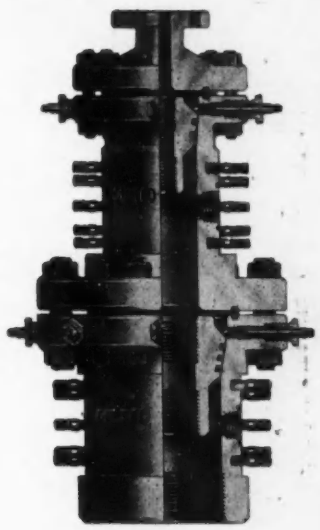
EASY TO INSTALL

Gulfco Burners are installed in the fire box and are moved complete with the boiler. It isn't necessary to use fire bricks with this burner; another economy.

●

GULFCO BURNERS ARE SAVING MONEY AND GIVING BETTER PERFORMANCE FOR LEADING OIL COMPANIES





GULFCO WELL HEAD ASSEMBLIES

GULFCO Forged Steel Casing Heads and Tubing Heads can be made up in many combinations for both low pressure and high pressure wells.

Interchangeability of parts makes it easy to control any condition that may be found in the field.

All heads are designed for maximum strength to afford the desired safety factor. They are also compact in size to take up minimum space in the cellar.

Steel used in GULFCO Heads is ordered especially to fit the conditions encountered. All materials are carefully inspected and are rejected if they do not come up to specifications.

Large stocks of all sizes and types of heads are carried in our warehouses for immediate shipment and any combination can be made up on short notice.

Gulfco Forged Steel for Safety

SEE GULFCO 20 PAGE SECTION COMPOSITE CATALOG

GULFCO FORGED STEEL FOR SAFETY

GULF COAST MACHINE & SUPPLY COMPANY

GULFCO TRADE MARK PRODUCTS

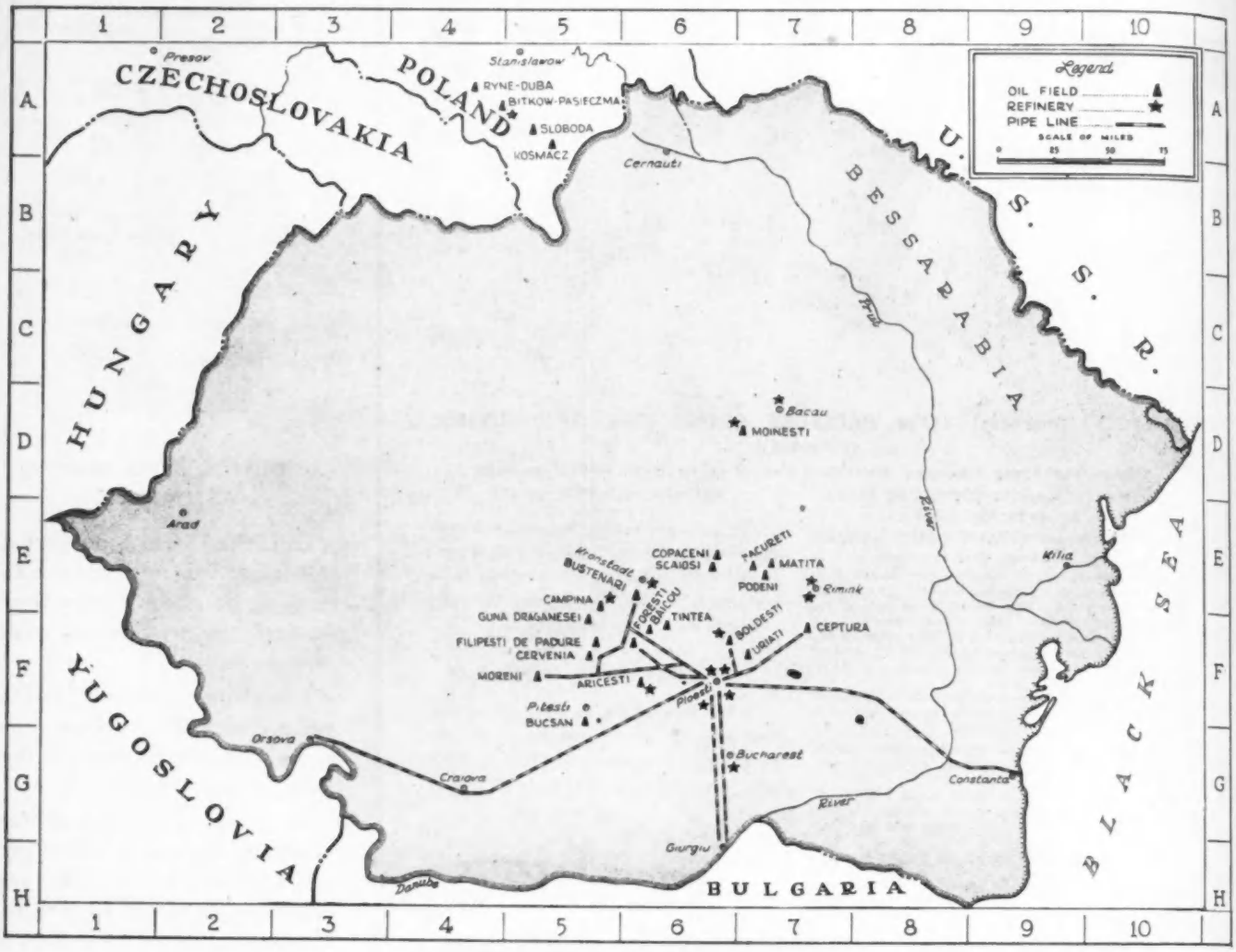
Houston Sales Office
200 Portwood St
Telephone: Woodcrest 6-8338

BEAUMONT, TEXAS

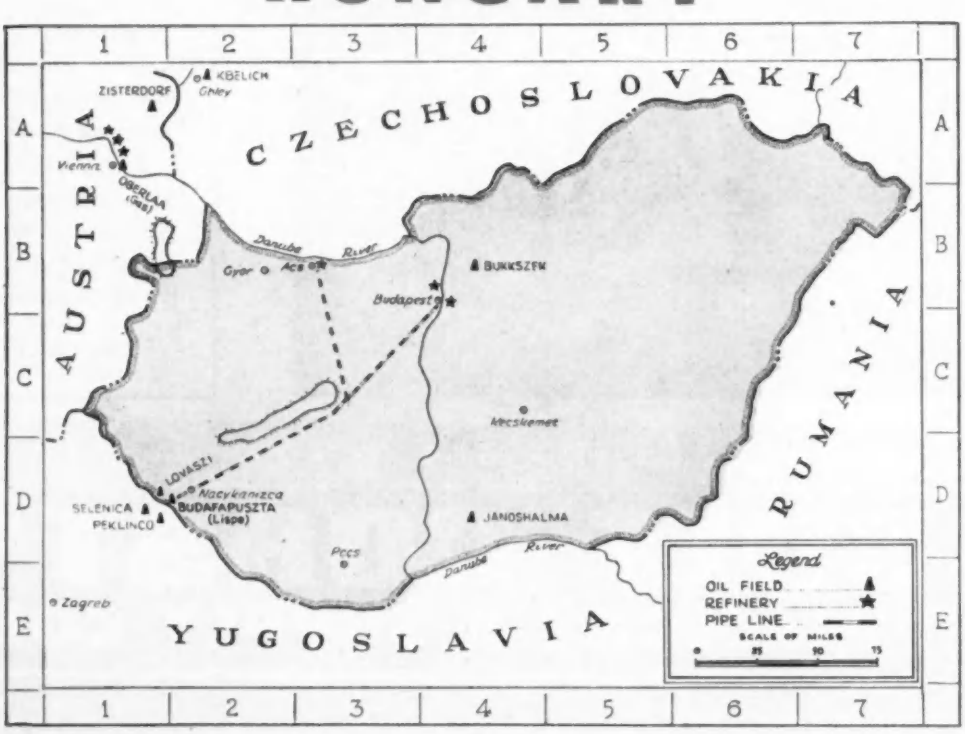
New York Export Office
92 Liberty St.
Telephone: Cortlandt 7-6930
Cable Address: "OILIND NEW YORK

GENERAL OFFICE AND SHOP: 305-315 South Mariposa St., P. O. Box 1989—Telephone 1328-1329—Beaumont, Texas

ROUMANIA



HUNGARY



Our 20 years of geophysical surveys and interpretations in fields throughout the world will be of inestimable value in mapping your course of future oil development.

PETTY GEOPHYSICAL ENGINEERING CO.

SEISMIC — MAGNETIC — GRAVITY SURVEYS

SAN ANTONIO, TEXAS, U. S. A.

RUSSIA (UNION OF SOVIET SOCIALIST REPUBLICS) EUROPEAN SECTOR

See Map of Combined European and Asiatic Parts on Page 40

AGAIN!

Oilwell Swivels

—help establish another world's record for deep-drilling

Carrying the load of a drill string reaching 15,845 feet below the surface and going deeper. This "Oilwell" No. 150-B Swivel on Standard Oil Company of California's deep test at Coles Levee has been in heavy-duty service since 1941.

THE NO. 150-C SWIVEL is the latest model in "Oilwell's" 150 series, which has been associated with the drilling of record-breaking wells for many years. "Oilwell's" complete line includes modern streamlined swivels for all drilling requirements. One of these swivels—the No. 300-C—is conservatively rated for drilling to 17,000 feet with 4½-inch drill pipe—far exceeding present record depths.

3 out of 4 of the world's DEEPEST wells have been drilled with *"Oilwell" Swivels*

Coles Levee, California . . .	15,845 feet*
Wasco, California	15,004 feet
Buena Vista Hills, California . .	14,622 feet

**The world's deepest well—15,845 feet and going deeper when this advertisement was written.*

HANDLING RECORD STRINGS of drill pipe has become a common occurrence for "Oilwell" Swivels and clearly demonstrates the reserve capacity that is built into "Oilwell" equipment. It is significant that many record depths have been reached with "Oilwell" Swivels which had already seen years of heavy-duty service. "Oilwell" Swivels are built to last.

The basic design principles which have been proven in drilling so many of the world's deepest wells have been retained in "Oilwell's" present line of modern streamlined swivels. In addition, several refinements have been added which assure even greater dependability and longer service life of all parts. There is a dependable "Oilwell" Swivel of ample capacity and economical size for every drilling requirement. Send for descriptive bulletins.

OIL WELL SUPPLY COMPANY

Branches Serving All Oil Fields

Executive Office — Dallas, Texas
Division Offices—Columbus, Ohio
Dallas, Texas Los Angeles, Calif.

Export Division Office—
30 Rockefeller Plaza
New York City

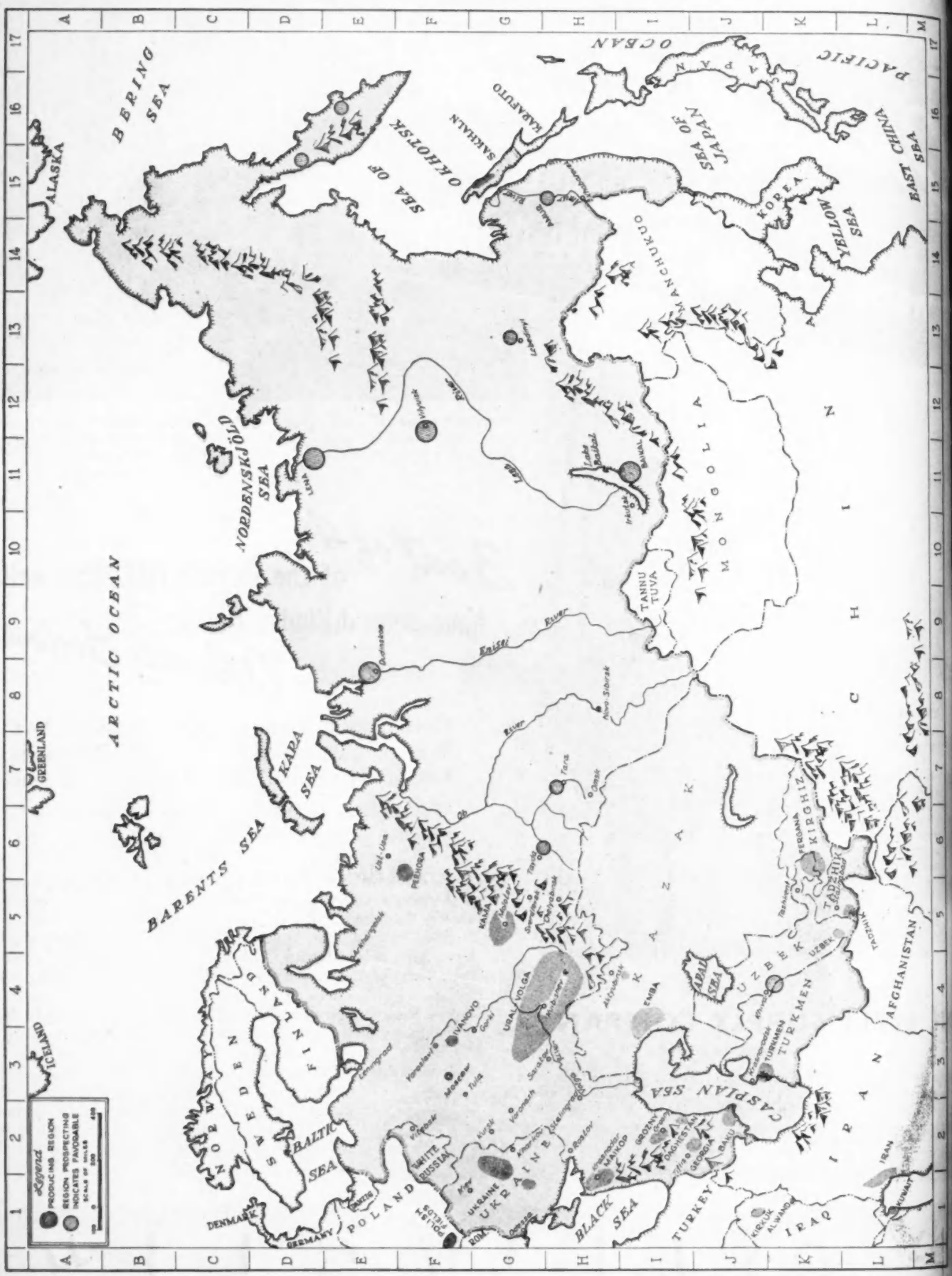
UNITED STATES STEEL

OIL WELL SUPPLY COMPANY · USS · OILWELL · UNITED STATES STEEL

"OILWELL"

RUSSIA UNION OF SOVIET SOCIALIST REPUBLICS

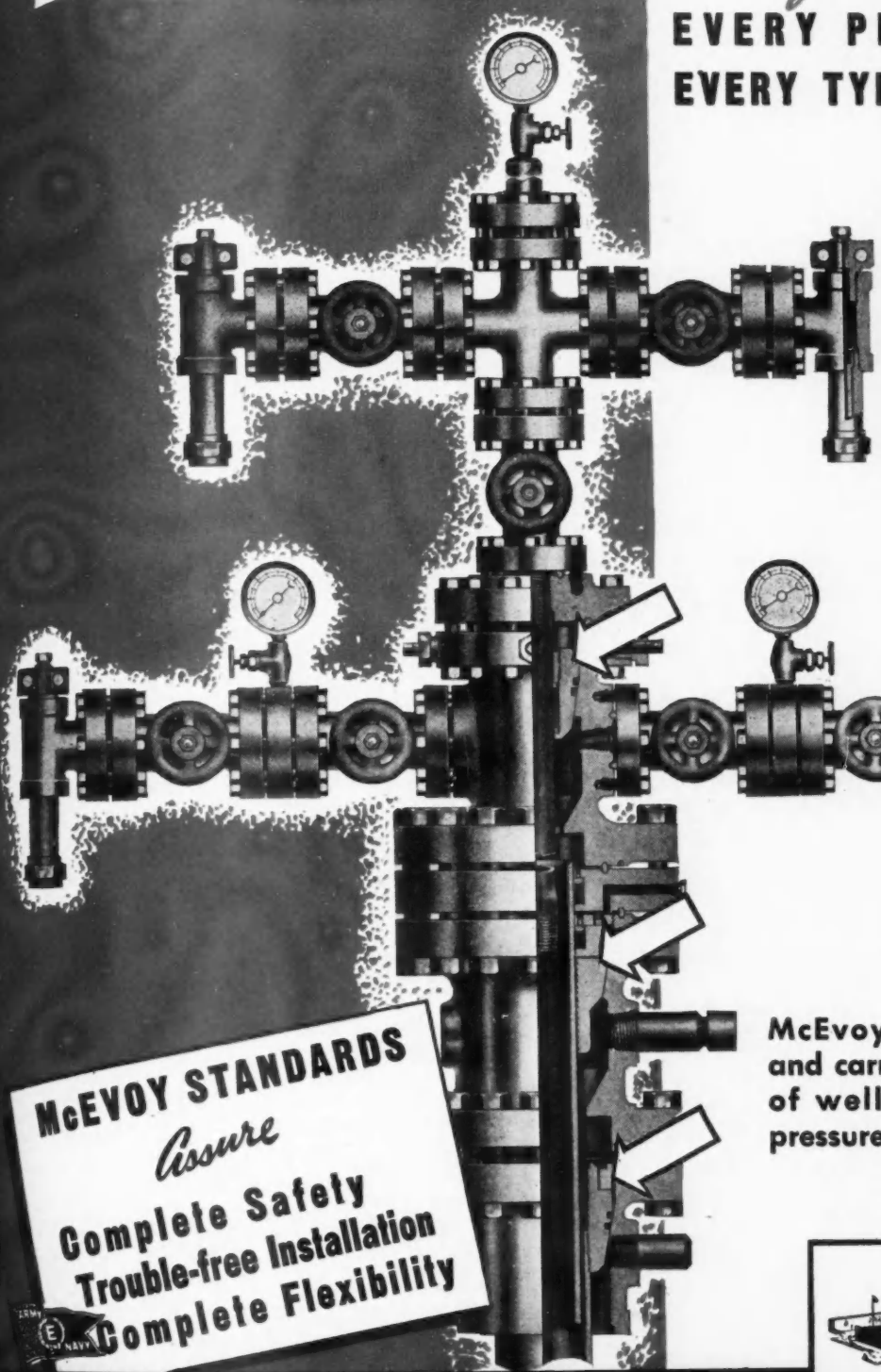
See Larger Scale Map of European Part on Page 38



McEvoy

CHRISTMAS TREES

for EVERY DEPTH
EVERY PRESSURE RANGE
EVERY TYPE OF COMPLETION

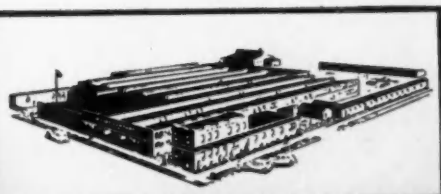


INTERCHANGEABLE
TUBING HANGERS
and
CASING HANGERS

The complete interchangeability among McEvoy tubing hangers affords last minute selection for any method of well completion.

McEVOY STANDARDS
Assure
Complete Safety
Trouble-free Installation
Complete Flexibility

McEvoy Company manufactures and carries in stock a complete line of well head equipment—in all pressure ranges.



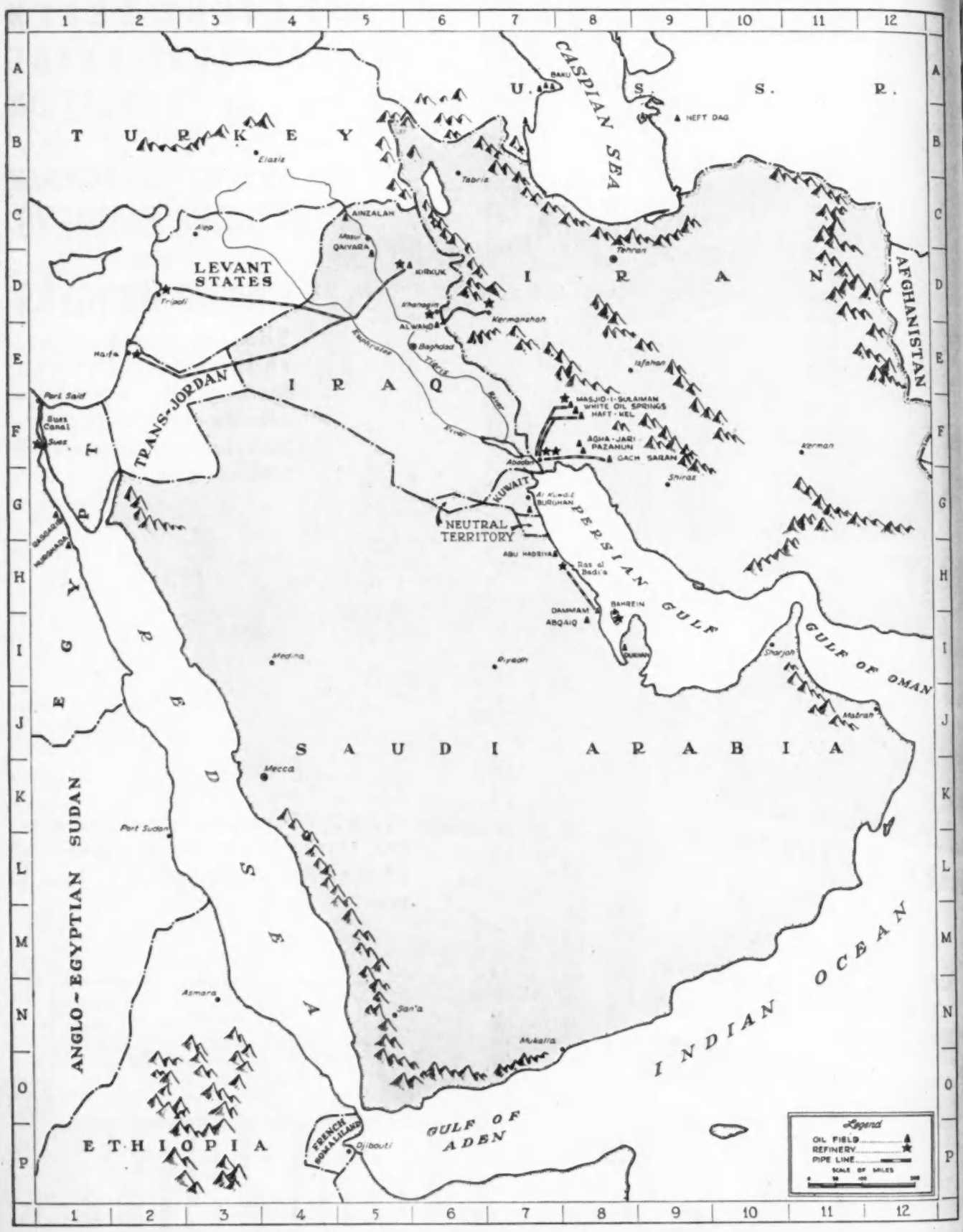
McEvoy COMPANY

HOUSTON, 1, TEXAS

NEAR EAST

BAHREIN, IRAQ, IRAN AND SAUDI ARABIA

Larger Scale Map of Producing Area of Above Countries Appears on Page 44



IN VENEZUELA AND COLOMBIA

A

COMPLETE EXPLORATION SERVICE

★

100% Seismograph Operations

Gamma Ray and Neutron Surveys

Well Logging by Mud Analysis.

Seismograph Service Corporation of Delaware

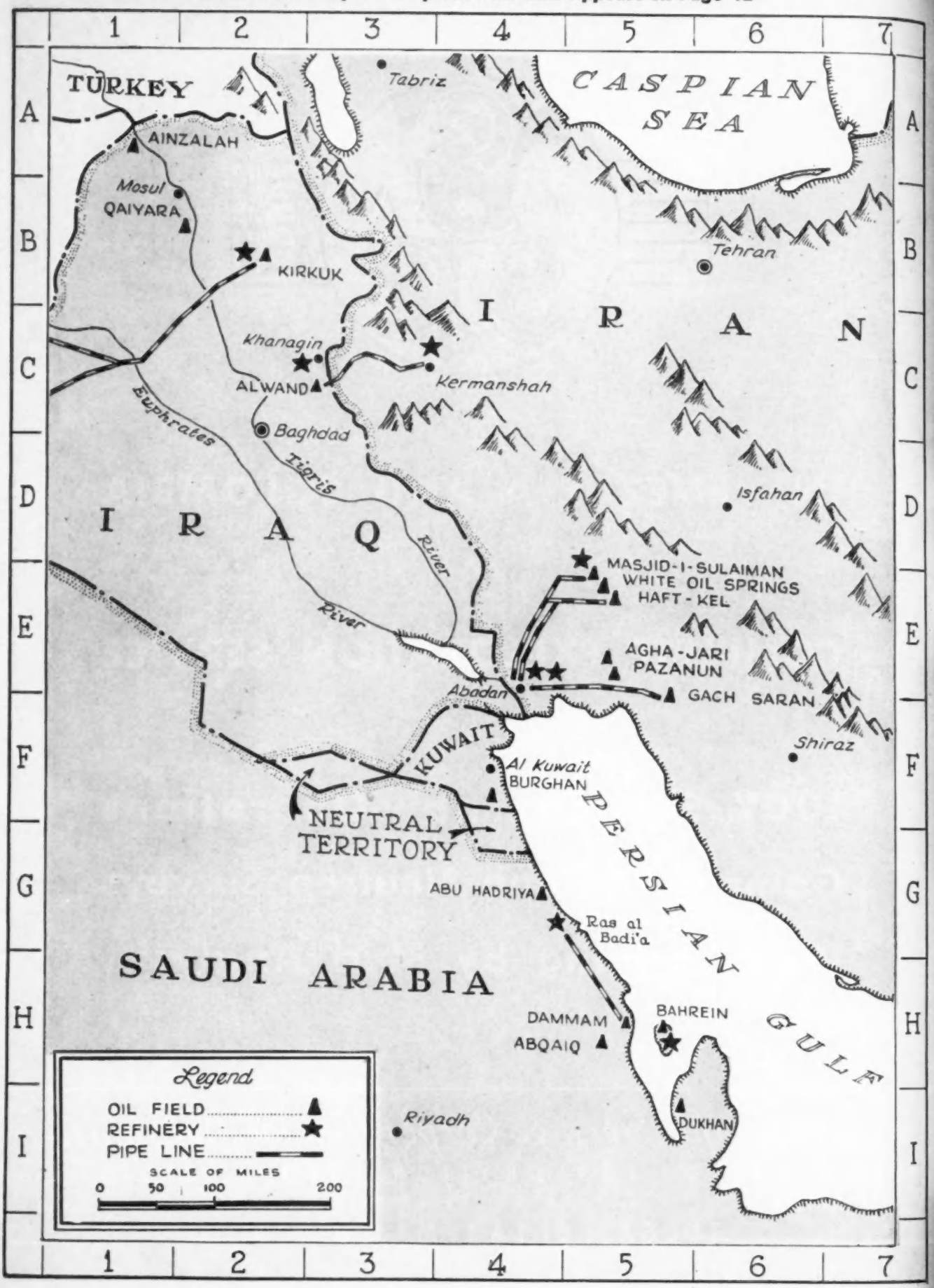
CONSULTING EXPLORATION GEOPHYSICISTS

Caracas, Venezuela — KENNEDY BUILDING — Bogotá, Colombia

TULSA, OKLAHOMA, U. S. A.

BAHREIN, IRAQ, IRAN, AND SAUDI ARABIA PRODUCING AREA

Smaller Scale Map of Complete Near East Appears on Page 42



Shaping up a better answer to packing problems

Sterling MEANS QUALITY

Die-Formed PACKING

"Sterling Engineered" gives new significance to packing efficiency with the advent of DIE-FORMED PACKING. It is the final measure of dependability in metallic packing designed for installations requiring extreme density.

When the rings have been cut from spirals of longitudinally folded metallic strands, they are "formed" in precision dies under pressure. This gives them accurate, uniform thickness, inside and outside diameters; compresses the folded metallic strands; makes them cross-sectionally square for closer fit on shaft and box. Result, a precision shaped packing with close tolerances of fit that gives you a leak-proof seal while permitting smooth, free, peripheral or longitudinal shaft movement at high speed.

Sterling Die-Formed packings are fabricated from all metals such as lead, copper and aluminum with or without fibrous cores, depending on the service requirements. They are also available in combination sets to meet specific installations.

Just as "Sterling Engineered" die-formed packings shape a better answer to high density packing problems, so also will our experienced packing service give you the correct solution for all of your packing problems. Talk to Sterling first about your packing needs.

STERLING PACKING & GASKET CO.

(Incorporated)

Houston, Texas

CHINA and JAPAN

Boundaries Shown Are Prewar

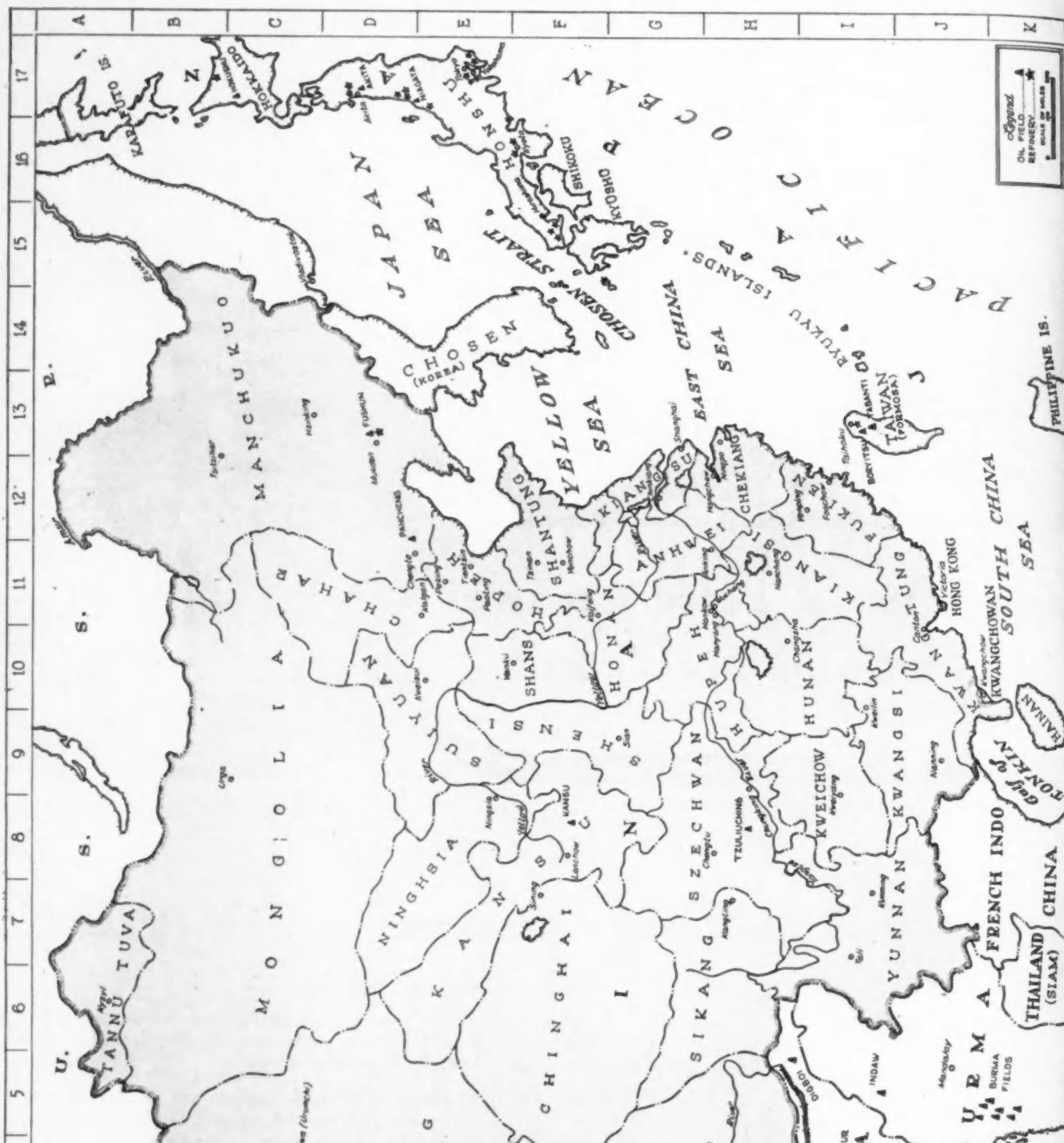
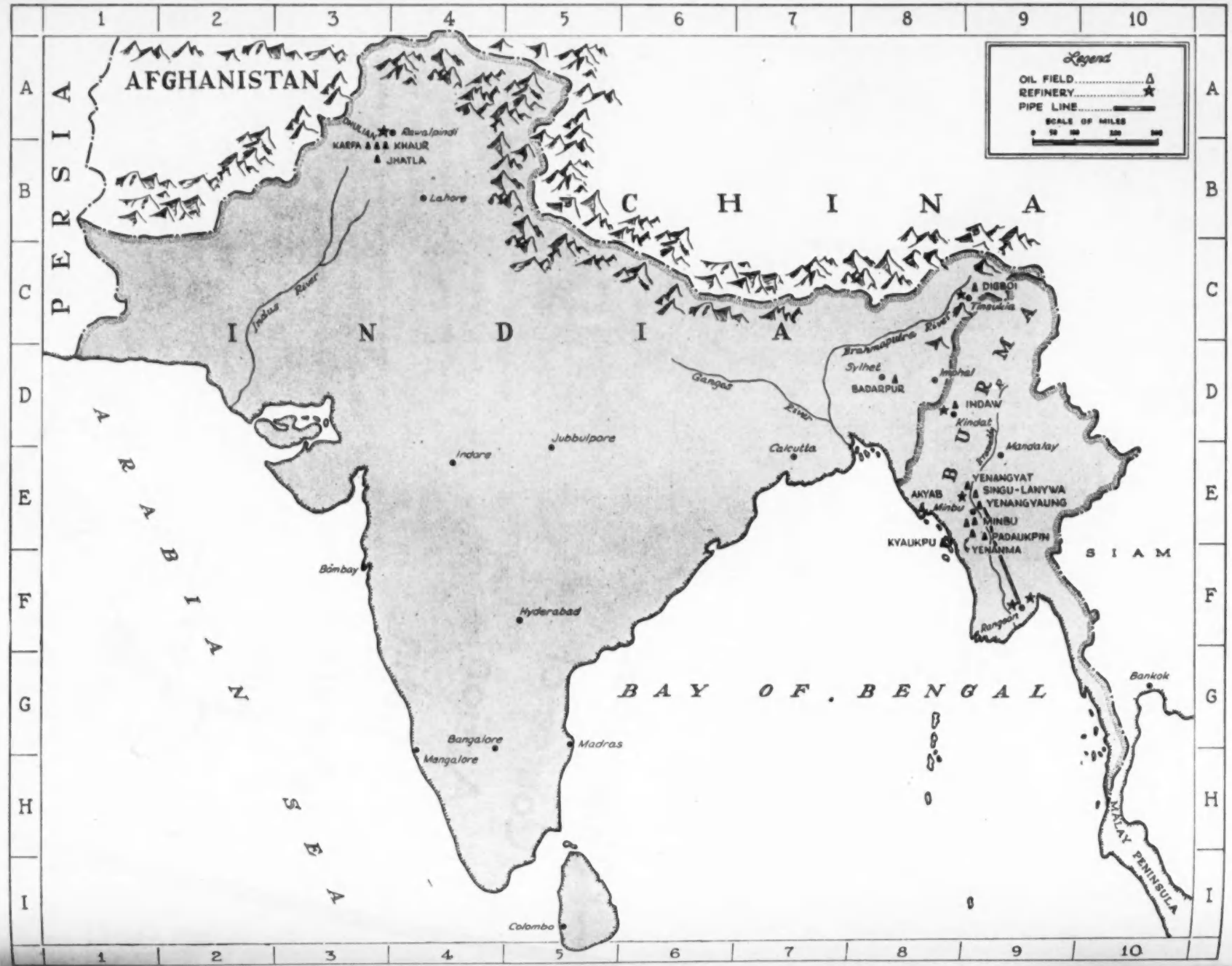


Chart your Course of Action in Latin America with *General* PLANNED STRATEGY

Authentic information, based on the accurate interpretation of seismological surveys and the thoroughness of sub-surface mapping is the key to correctly planned strategy for a program of drilling operations. General Geophysical crews . . . highly trained, outfitted with modern equipment and employing the most advanced geophysical techniques . . . are seasoned experts at compiling such geophysical data. Experience gained by widespread operations in North America will be reflected in the accuracy of General's PLANNED STRATEGY for drilling programs of Latin American operators.

General
GEOPHYSICAL COMPANY GGC HOUSTON

INDIA and BURMA



GREAT GUNS!

Call Schlumberger for your next gun perforating job and note the difference.

SCHLUMBERGER
WELL SURVEYING CORPORATION
HOUSTON, TEXAS

BORNEO

BRUNEI

CELEBES

CERAM

JAVA

NEW GUINEA

SARAWAK

SUMATRA

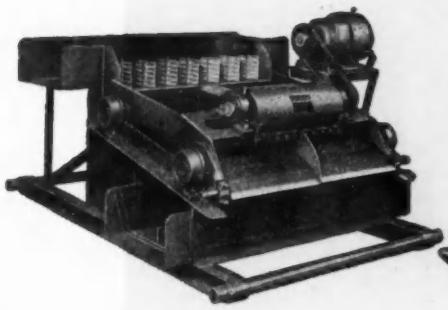
AND

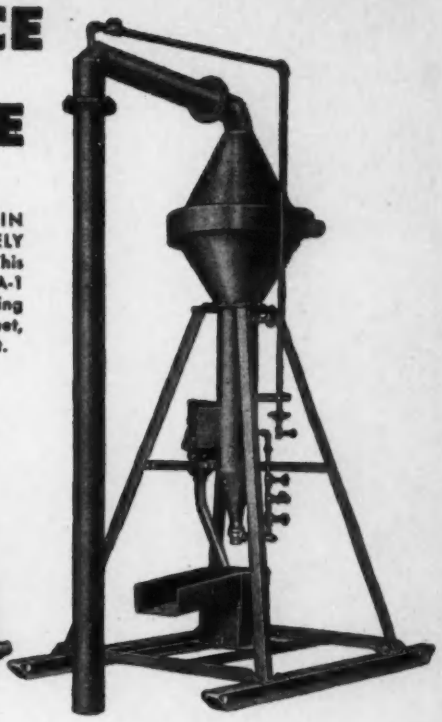
TIMOR

Maximum PERFORMANCE AT *minimum* EXPENSE

●VERNON-CORWIN DESANDERS and McNEELY VIBRATING MUD SCREENS are correctly designed and carefully built to save time, labor and money. Because of this, they assure the maximum in performance and the minimum in operating expense on the job. So if you want the BEST, investigate these VERNON products. VERNON has been making quality oil well specialties for years.

At Right: VERNON-CORWIN DESANDER. *Below:* McNEELY VIBRATING MUD SCREEN. This is available in three models—A-1 with 9 square feet of screening surface; G-7 with 16 square feet, and F-6 with 20 square feet.





VERNON TOOL CO., LTD.

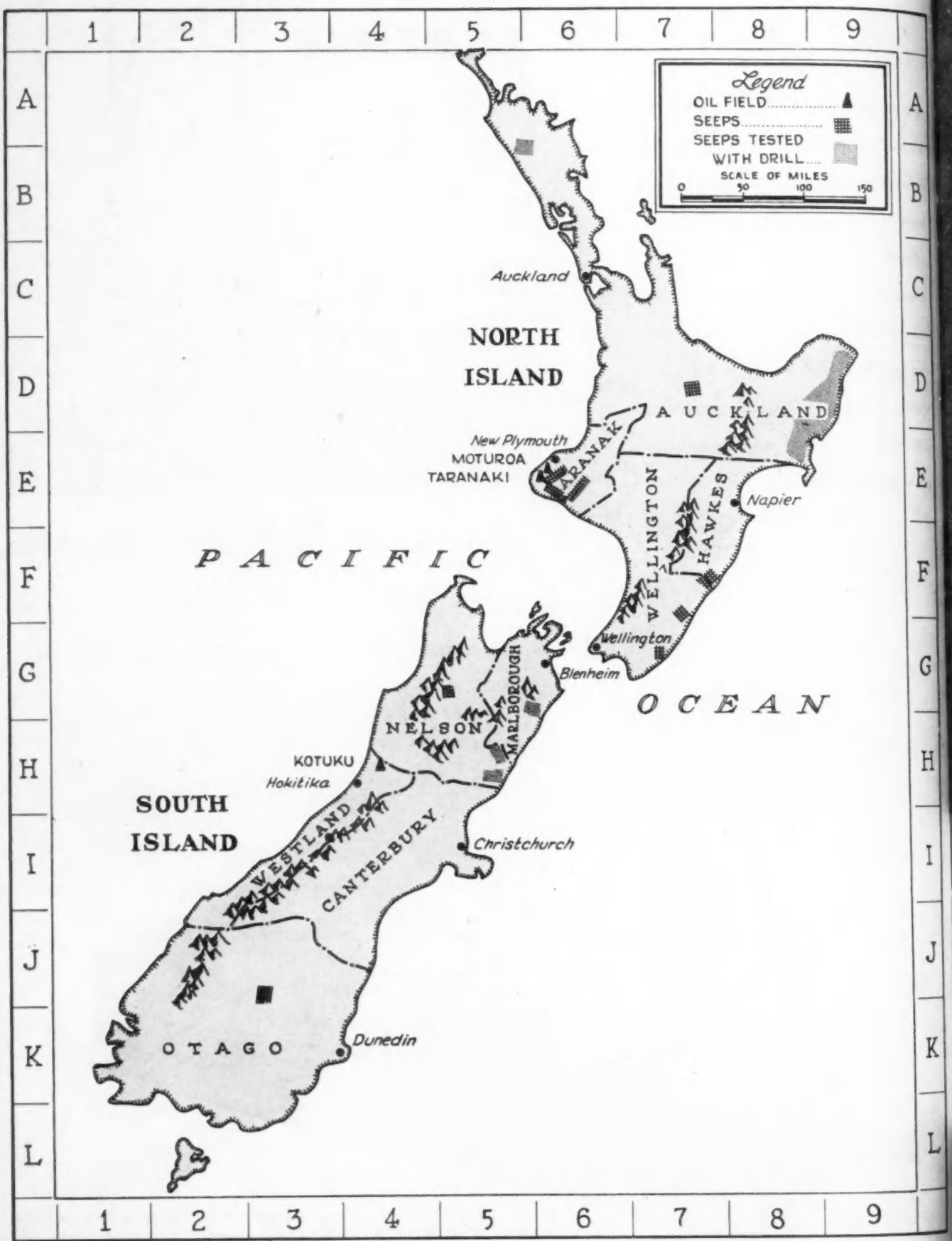
1101 MERIDIAN AVENUE • ALHAMBRA, CALIFORNIA

Gulf Coast and Mid-Continent Representative:

McNEELY MATERIALS COMPANY • 2935 JENSEN DRIVE, HOUSTON, TEXAS

Unitized Drilling Mud Outfit consisting of a VERNON-CORWIN DESANDER, two Model G-7 McNEELY VIBRATING MUD SCREENS and a McNEELY MUD PUMP. Smaller view shows unit with Desander in position for transportation.

NEW ZEALAND


Legend
OIL FIELD
SEEPS
SEEPS TESTED WITH DRILL
SCALE OF MILES
0 50 100 150
Auckland
NORTH ISLAND
AUCKLAND
New Plymouth
MOTUROA
TARANAKI
TARANAKI
WELLINGTON
HAWKES
Napier
PACIFIC
OCEAN
Wellington
Blenheim
NELSON
MARLBOROUGH
KOTUKU
Hokitika
SOUTH ISLAND
WESTLAND
CANTERBURY
Christchurch
OTAGO
Dunedin

CORROSION PREVENTION
for all metal surfaces

We've put plastics to work protecting many oil field products . . . giving greater efficiency to their performance . . . substantially increasing their service life. By the patented Tube-Kote process plastic coating can be applied to tubular goods, valves, fittings, packer assemblies, pump parts, casing heads, and many other types of metal and steel products used by the oil industry. They can be plastic coated internally and externally. All threads are also coated.

"Tube-Koting" prevents corrosion . . . withstands high abrasion . . . is unaffected by most solvents and acids . . . has excellent surface slip, reducing adhesion of paraffin and scale . . . withstands temperatures up to 350 degrees F. . . .

The many types of equipment we have "Tube-Koted" indicate an unlimited number of applications for our type of corrosion prevention. Investigate its possibilities for your equipment. Write us for complete information.

TUBE-KOTE, INC.

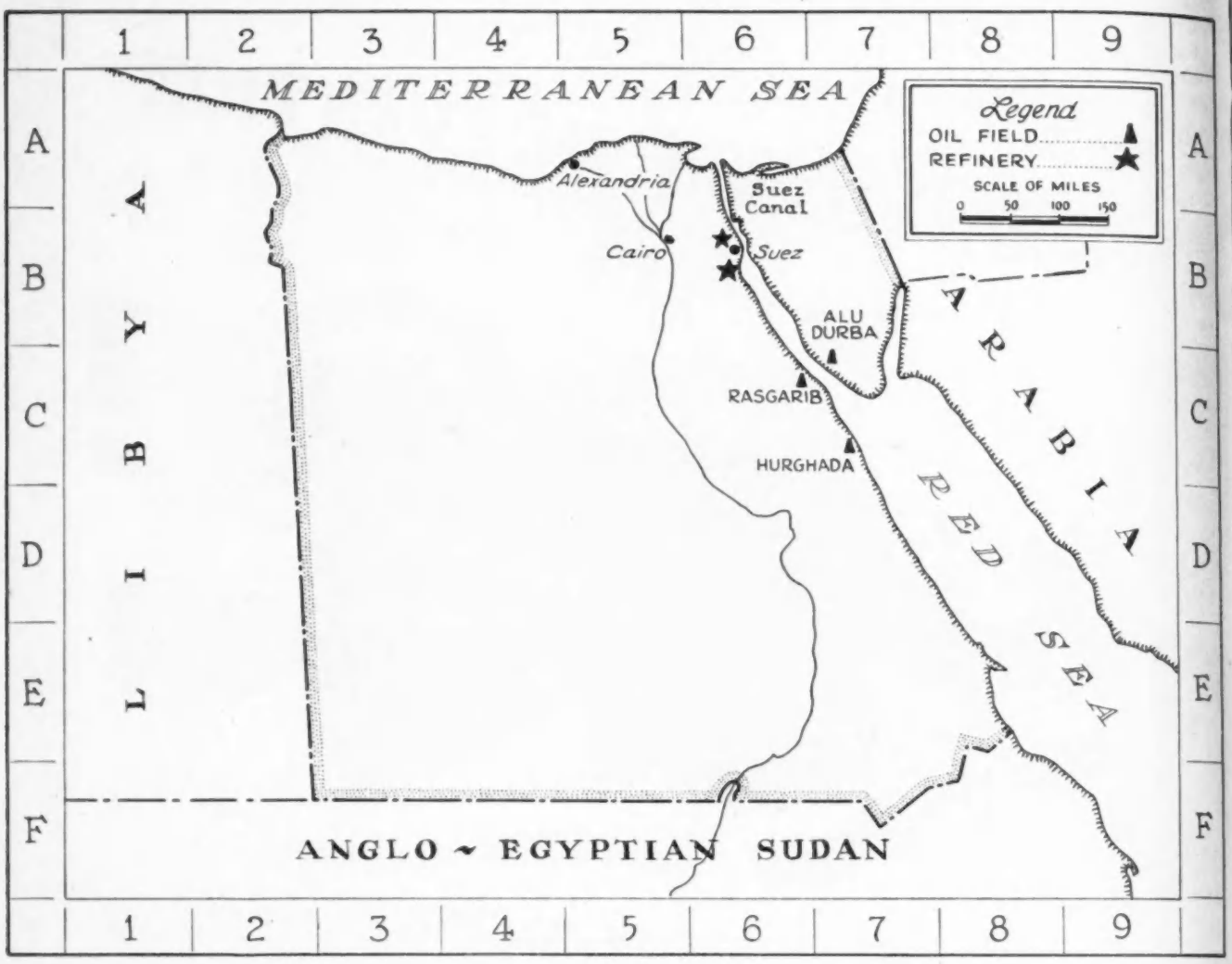
Patents Pending.

2520 HOLMES RD. **P. O. BOX 1822**
HOUSTON, TEXAS

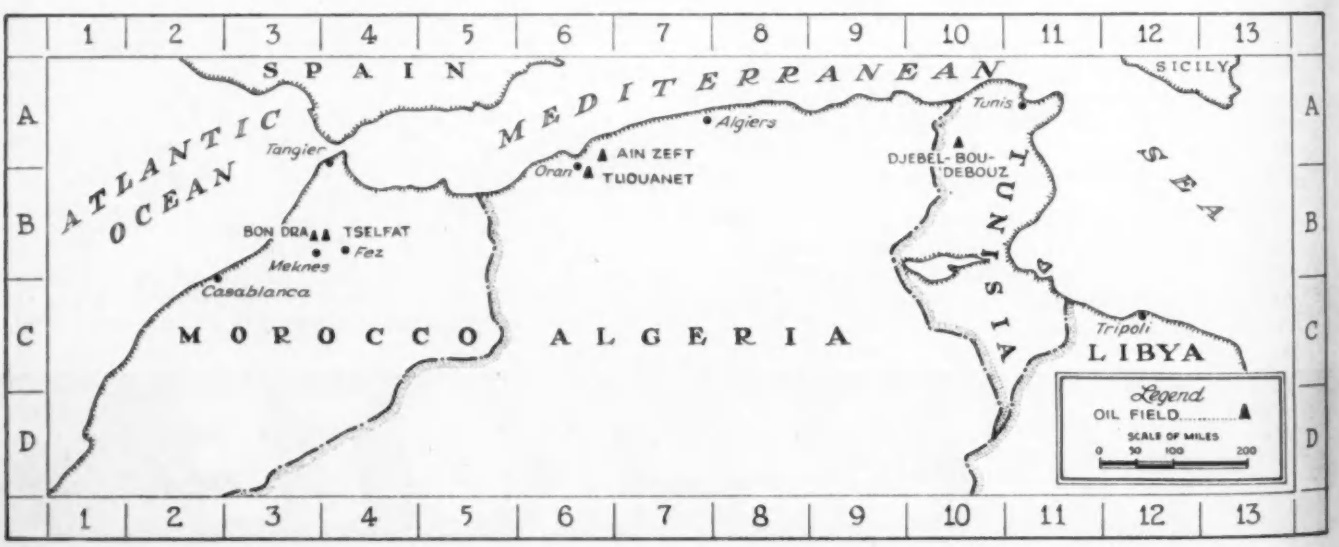
TUBE-KOTE

Internal and External PLASTIC COATING SERVICE for most types of metal and steel products

EGYPT



ALGERIA—MOROCCO—TUNISIA



Western GEOPHYSICAL COMPANY

Combining in one organization the largest and most complete geophysical research facilities in the world together with unexcelled equipment, experienced field crews and proven interpretation technique, Western Geophysical Company meets every requirement of operators desiring a *complete* and well-rounded geophysical service.

Western's seismic and gravity crews are now operating in all parts of the United States and in South America. Western service is available for surveys in any part of the world. Inquiries are invited.

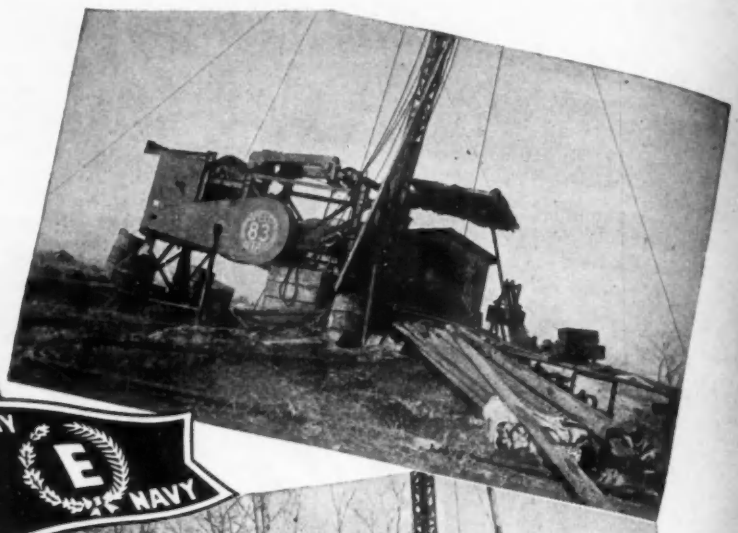
Western GEOPHYSICAL COMPANY

HENRY SALVATORI, PRESIDENT

EDISON BLDG., LOS ANGELES 13, CALIF. ★ FIRST NATIONAL BANK BLDG., DALLAS 2, TEXAS

118 COMMERCE ST., NATCHEZ, MISSISSIPPI

Awarded to the men and women of Star Drill "for their patriotism and great work in backing up our soldiers on the fighting fronts."



Star No. 83's at work in Pennsylvania, Illinois and Oklahoma.

STAR DRILLING MACHINES
WILL PRESENTLY BE AVAILABLE AGAIN

For many months Star's entire production has been taken by our armed forces. The Engineers Corps says: "The No. 71 Speed Star drill is standard equipment and at present is in service overseas." The United States Navy says: "You are to be commended for furnishing the Navy with such excellent drilling equipment to help maintain the morale and health of our fighting men." The Army Ordnance says: "With the aid of Star the Army has succeeded in mounting a 75 mm. cannon on the new bombers to produce a weapon of terrific striking power. This is the largest gun yet mounted on a plane."

Our forging and heat-treating facilities have been expanded greatly to furnish more efficient jars, bits, stems and other oil field tools.

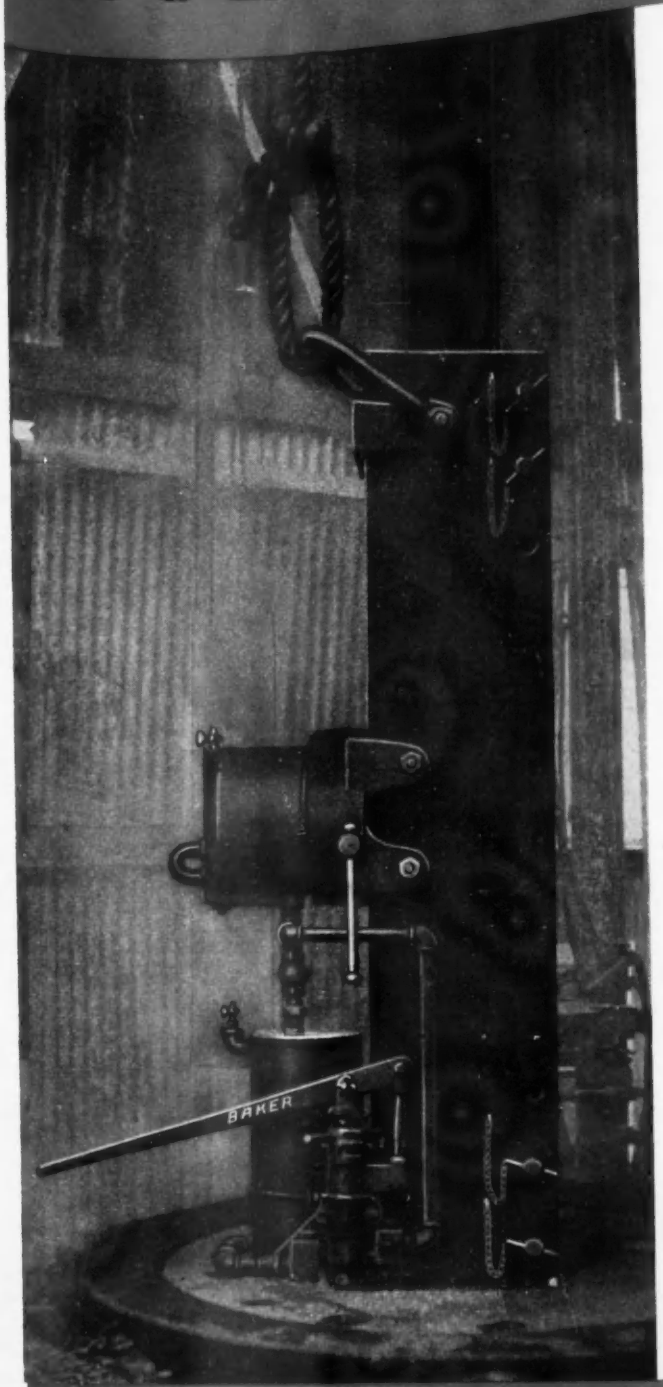
It is our earnest hope that soon we may return to our peacetime business — and to you, Star's valued customers. We shall be able to give you better drilling machines, designed for economical operation and longer, trouble-free life, as well as more efficient tools for longer life and improved performance.

Meanwhile, we will do everything we can to help you get the most out of Stars now on the job and to prolong their period of service.

THE STAR DRILLING MACHINE COMPANY
AKRON 11, OHIO

56 Years Serving the Oil Industry

AN IMPORTANT ANNOUNCEMENT to a LIMITED NUMBER of Operators



in 1945

. . . we are arranging to produce a limited quantity of Baker Portable Hydraulic Kelly and Pipe Straighteners. This unit has been in great demand for *conserving* the life of Kellys and drill pipe, and for *salvaging* all types of tubular goods. If you are interested in securing one of these handy, efficient devices, we suggest that your order be placed promptly with the Baker office most convenient to you.

- ★ Straightens Kelly, Drill Collar or Drill Pipe as it hangs suspended in the derrick.
- ★ Weighing only 1,400 pounds complete, it can be transported easily on a small "pick-up" truck, and lifted on the rotary table by means of the catline.
- ★ Straightens Kelly or Drill Pipe *at the rig*, the proper place to straighten bends caused in service, during transportation, or when laid down or picked up.
- ★ Ideal for use in foreign fields or in isolated locations, where transporting the Kelly or drill pipe from rig to shop often is a serious and expensive procedure.
- ★ Compact in size, but handles pipe up to 8¾-inch diameter.

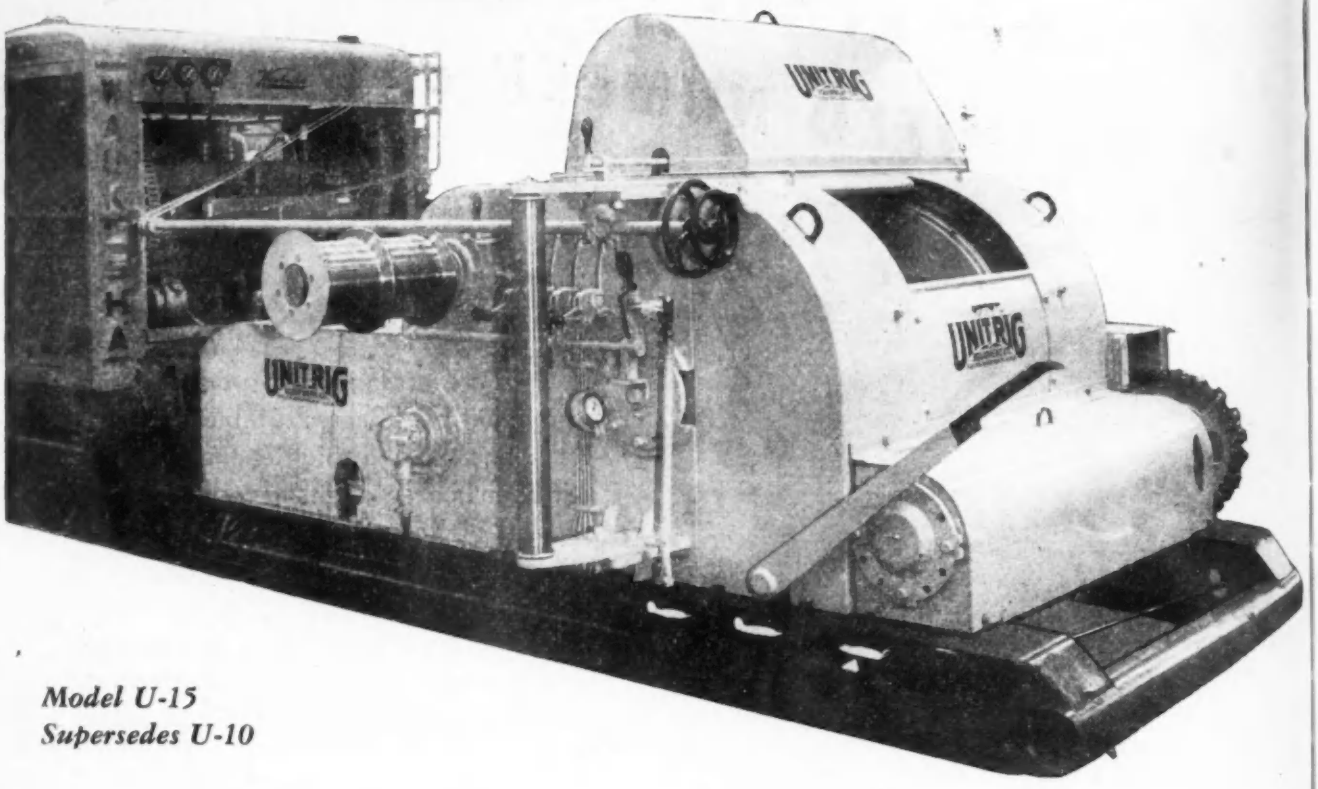
BAKER OIL TOOLS, INC.

Houston - LOS ANGELES - New York

BAKER PORTABLE

HYDRAULIC KELLY AND PIPE STRAIGHTENER

New



Model U-15
Supersedes U-10

-in the field of Rotary Drilling

The Model U-15 Hydromatic brake mounting is an innovation in brakes. The high speed Parkersburg Hydromatic brake adds little weight to the unit, compared to the larger brakes that are coupled direct to the drum shaft, and does not increase the overall width of the unit, since it is mounted on top of the draw-works case.

From the standpoint of operation it has unusual operating characteristics in that there is little resistance at the initial falling of the load. As the block speed accelerates in falling, the brake absorbs the braking energy at an increased rate, thus serving as an excellent governor of the drum. Drillers appreciate the fact there is little to do in the way of controlling the Hydromatic brake. They do not have to declutch it while elevating the blocks as should be done with the bigger brakes because of the drag. To control the fall of the block — it is only necessary to regulate a valve in the inlet water line.

Repeated performance shows that the brake rims absorb so little of the energy that they remain cool to the touch even at depths of 6000 feet and deeper with 4½" drill pipe. The brake assembly is equipped with a clutch so that the brake can be disengaged when coming out of the hole with the drill pipe.

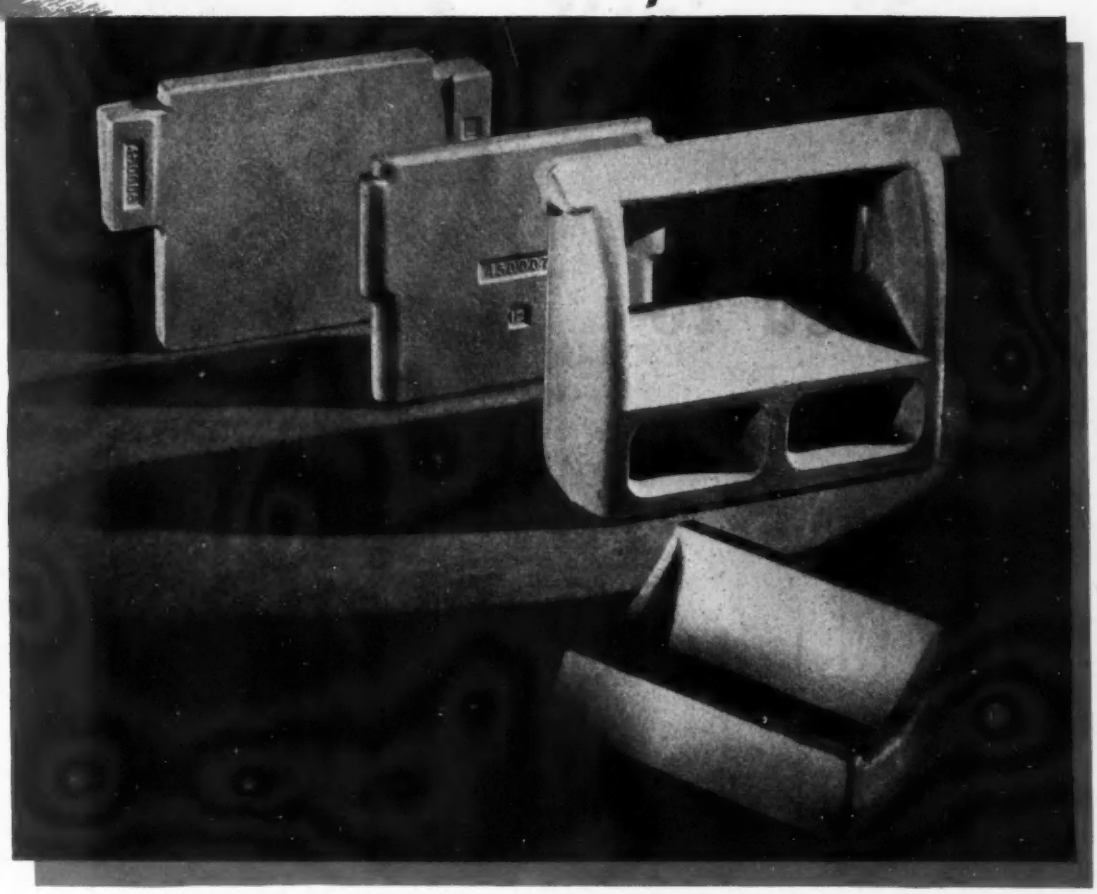
Buy War Bonds

UNIT RIG & EQUIPMENT CO.
TULSA OKLAHOMA U.S.A.

Keep Up Production

THE OIL WEEKLY, published every Monday. Entered as second class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

PRECISION FORGINGS *by* INTERSTATE



HIGH standards of production and careful inspection have been combined to produce this set of forgings which is assembled without machining. Accurate dies and vigilant inspection hold these parts to close tolerances. . . .

For years Interstate has specialized in the production of forgings for the leading manufacturers of oil well equipment. Our technical staff is available to assist you in your forging problems.

KEEP THEM WINNING — BUY MORE BONDS!

INTERSTATE

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DROP FORGE COMPANY

4021 NORTH 27TH ST. MILWAUKEE 9, WIS.

DROP OR UPSET FORGINGS · CARBON OR ALLOY STEELS · HEAT TREATING · METALLURGICAL CONTROL · MAGNETIC INSPECTION EQUIPMENT

sound financial principles applied to the OIL and GAS Industry

Your City National Bank announces the opening of an Oil and Gas Department. Through this department, headed by Mr. George L. Nye, an experienced oil executive, we desire to come into closer contact with, and to service, the financial needs of those who are associated with petroleum operations. With these enlarged facilities, we sincerely hope that you will not hesitate to call on us when we can be of assistance to you.

THE CITY NATIONAL BANK
HOUSTON

HERE IS AN UNPARALLELED ACHIEVEMENT IN COMPLETION

Control

The Cameron Ram Type Tubing Control Head

Employing numerous features of the famous Cameron Drilling Control Units, the Ram-Type Tubing Control Head provides positive blowout protection while tubing is being run, well washed, packer collapsed, tubing suspended, etc. As the foundation for the Cameron Closed Pressure Method of Well Completion, this tubing head has demonstrated its incomparable safety and efficiency on hundreds of the world's deepest, highest pressure wells. Its unique design, providing ram-type blowout preventer control during initial completion or re-completion operations and permitting the use of several types of tubing suspension and seal, makes it equally outstanding in the field of equipment required for multi-zone completions.

The most widely used type of suspension and seal—the hanger nipple equipped with back-pressure valve and suspended and sealed on the closed rams of the head—is illustrated in the cross-section view above.

CAMERON IRON WORKS, INC.

711 MILBY ST., HOUSTON, TEXAS

Export: 74 Trinity Place, New York, N. Y. *California:* Howard Supply Co., Los Angeles. *Rocky Mountain:* Mountain Sales & Service, Casper, Wyo. *Oklahoma:* 310 Thompson Bldg., Tulsa.

There's Been a Big Change

★ Yesterday's picks and shovels have given way to modern earth-moving giants. Yesterday's conventional tapered roller bearings have bowed to Tyson—the bearings with 30% more load-carrying rollers around the raceway.

More rollers mean extra capacity . . . longer bearing life . . . more dependable performance on every heavy-duty job.

Today, this rugged Tyson "All-Rolls" bearing is proving its superiority in industry, transportation and agriculture. Use Tyson. You'll go farther.

TYSON BEARING CORPORATION • MASSILLON, OHIO

COUNT THE ROLLS · THE ROLLS COUNT

Tyson

TODAY'S HEAVY-DUTY BEARING

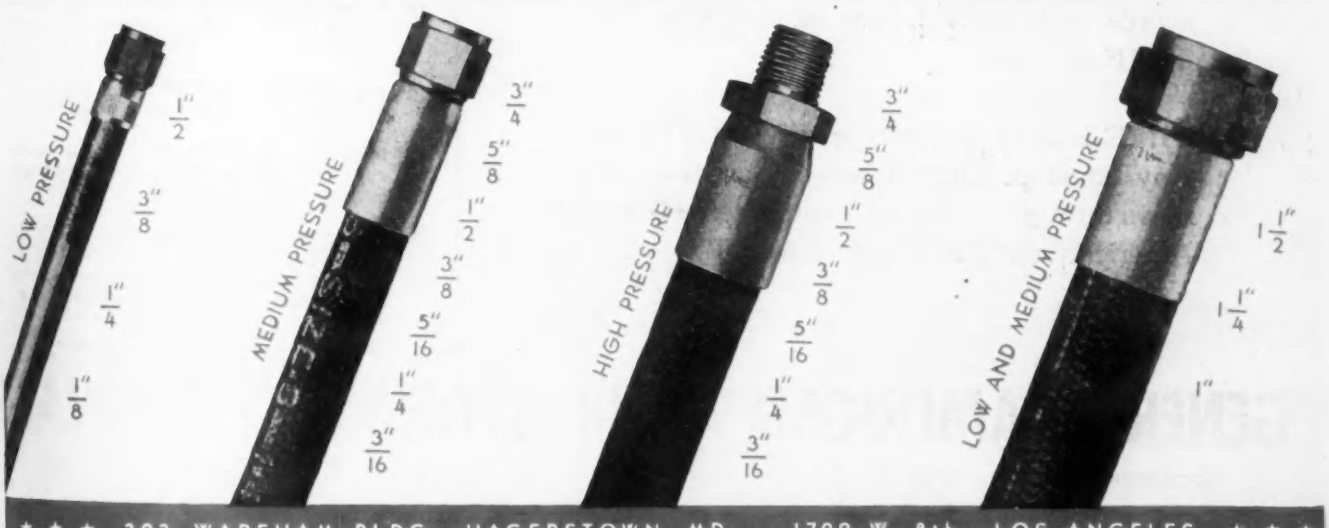
★ BUY MORE WAR BONDS ★

WAR TESTED ON AIRCRAFT ALL OVER THE WORLD
NOW AVAILABLE FOR INDUSTRIAL APPLICATIONS

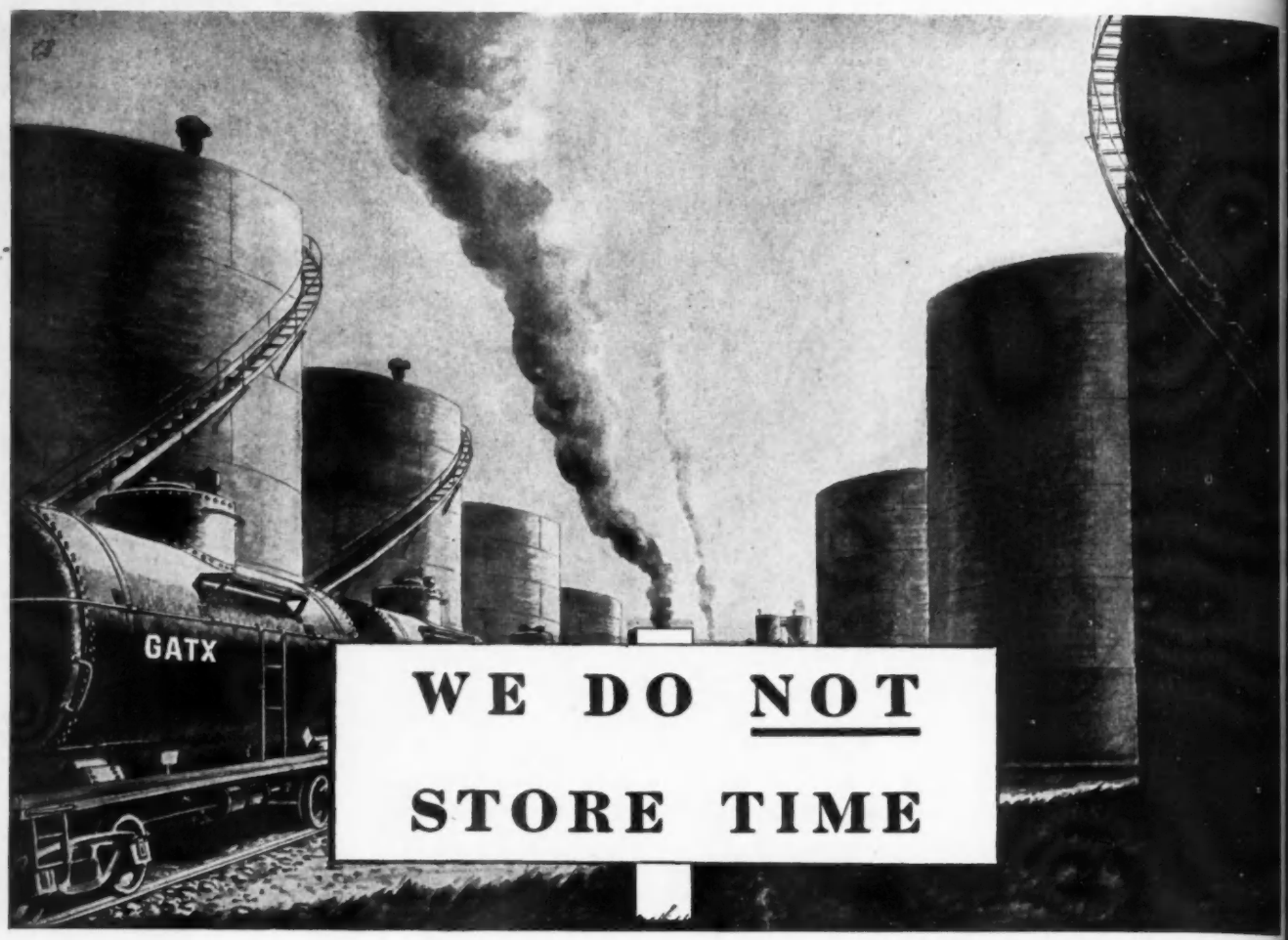
3 PIECES *(EACH REPLACEABLE)*

ASSEMBLY WITHOUT SPECIAL TOOLS. NO TIGHTENING OR ADJUSTMENT AFTER ASSEMBLY. FITTINGS CAN BE REMOVED FROM HOSE AND RE-USED OVER 100 TIMES.

AEROQUIP CORPORATION
JACKSON, MICHIGAN, U. S. A.


LOW PRESSURE
1/8" 1/4" 3/8" 1/2"
MEDIUM PRESSURE
3/16" 1/4" 5/16" 3/8" 1/2" 5/8" 3/4"
HIGH PRESSURE
3/16" 1/4" 5/16" 3/8" 1/2" 5/8" 3/4"
LOW AND MEDIUM PRESSURE
1" 1 1/4" 1 1/2"

★ ★ ★ 303 WAREHAM BLDG., HAGERSTOWN, MD. - 1709 W. 8th., LOS ANGELES ★ ★ ★



Nor do we want to. TIME is for use, constantly. The keynote of General American Terminal service is to use TIME to your advantage. Trained crews, ready to give supervised service at any hour of the day or night —strategic placing of terminals, convenient to source and market, are designed to save TIME for you.

TIME is the *one* commodity we don't *store.* Any liquid product, however—anything that flows through a pipeline—can receive General American's SPEED with SAFETY.

GATX GENERAL AMERICAN

Six Exclusive General American Advantages for YOU:

1. **STRATEGIC LOCATIONS.** Low rail and ocean freight rates.
2. **RELIABLE CUSTODIANSHIP.** Our warehouse receipts are highest type of collateral everywhere.
3. **INDEPENDENT OWNERSHIP.** Strict privacy. We do not buy, sell, or refine oils.
4. **MODERN PROTECTION.** Latest safety appliances; lowest insurance rates; minimum evaporation losses.
5. **LARGE TANK CAR FLEET.**
6. **NO CONTAMINATION.** Separate pumps, lines, storage zones for dissimilar commodities.

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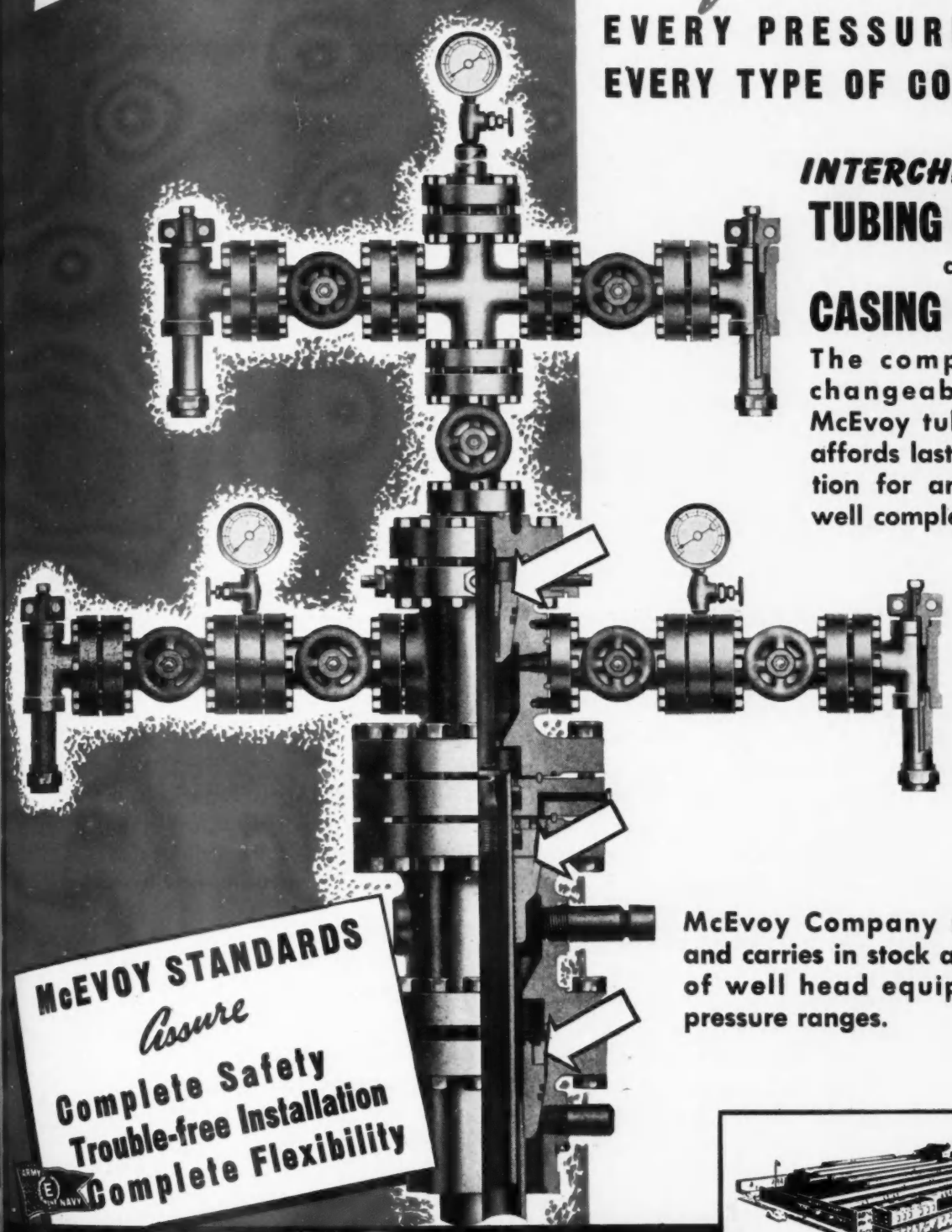
A Division of General American Transportation Corporation

McEvoy

CHRISTMAS TREES

for EVERY DEPTH
EVERY PRESSURE RANGE
EVERY TYPE OF COMPLETION



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TUBING HANGERS
and
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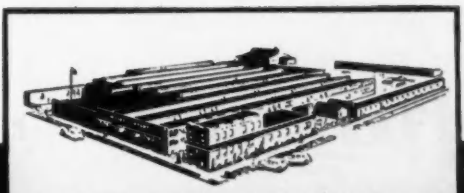
The complete interchangeability among McEvoy tubing hangers affords last minute selection for any method of well completion.

McEVOY STANDARDS
Assure
Complete Safety
Trouble-free Installation
Complete Flexibility

McEvoy Company manufactures and carries in stock a complete line of well head equipment—in all pressure ranges.



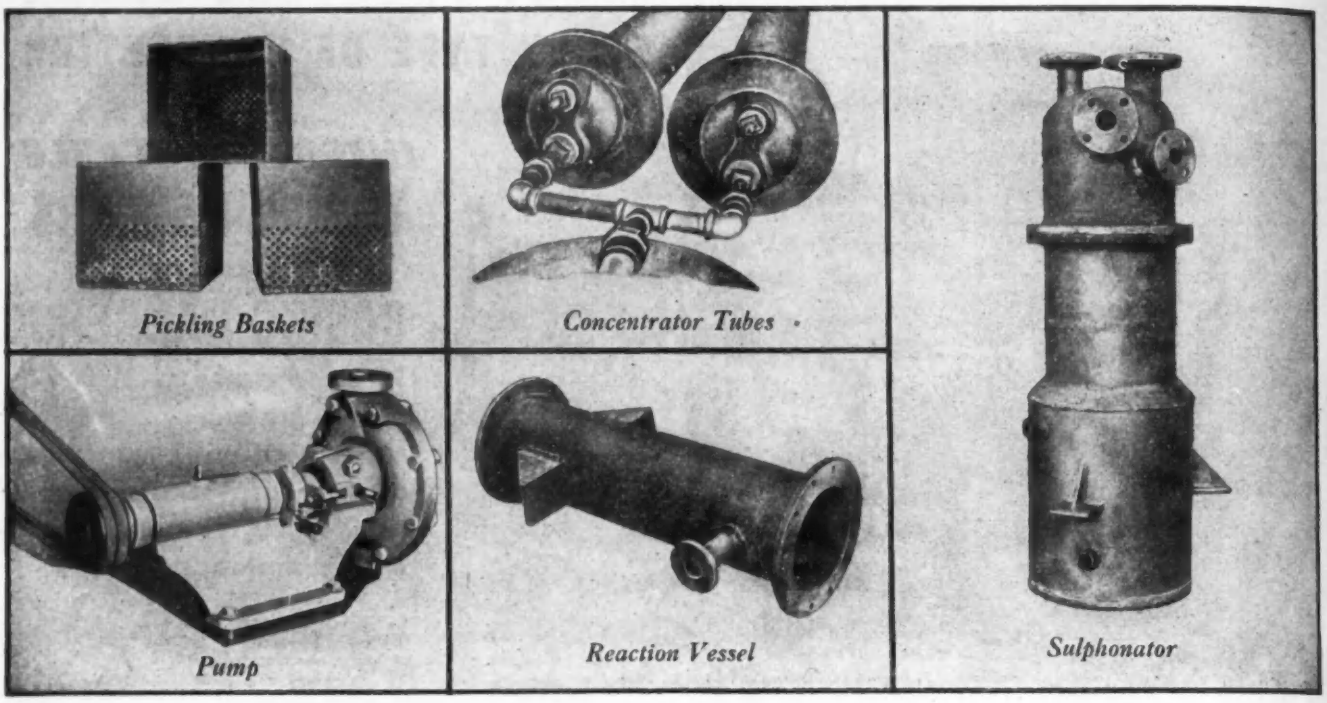
McEvoy COMPANY

HOUSTON, 1, TEXAS

You can now get

FABRICATED UNITS OF PROCESSING EQUIPMENT

made of HASTELLOY Corrosion-Resistant Alloys



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Concentrator Tubes

Pump

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Sulphonator

● The HASTELLOY alloys that have proved so successful in handling hydrochloric and sulfuric acids, wet chlorine, and other corrosive agents are now available in completely fabricated units. Autoclaves, evaporators, agitator units, fractionating columns, pumps, valves, and other standard or specially designed equipment are being made from HASTELLOY corrosion-resistant alloys by reliable equipment manufacturers and fabricators.

If you build processing equipment, we can supply you with HASTELLOY alloys in all the standard mill forms—sheets, plate and bar stock, pipe and pipe fittings, and nuts and bolts. In addition, we can make castings from your patterns; or we can make castings to meet your design.

Our engineers have had broad experience in the use of HASTELLOY alloys. They can help you decide where installations of these alloys may economically solve your corrosion problems.

The booklet, "HASTELLOY Corrosion Resistant Alloys" contains more information on these alloys. Write for it. If you wish, we will send our price list as well. Address your request to any Haynes Stellite Company office.

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Unit of Union Carbide and Carbon Corporation

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HIGH-STRENGTH NICKEL-BASE ALLOYS FOR CORROSION RESISTANCE

The word "Hastelloy" is a registered trade-mark of Haynes Stellite Company.

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LANE-WELLS SERVICES AND PRODUCTS CAN HELP YOU CUT OIL PRODUCTION COSTS

FROM Texas to California, from Louisiana to Montana—in nearly every State in which petroleum is produced—Lane-Wells is on the job, night and day, in winter and summer, helping well operators produce *more* oil *more* efficiently. Backed by the practical field experience under every conceivable condition on many thousands of different jobs each year, Lane-Wells Services and Products can help you produce more oil at lower cost per barrel.

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The TESCO hallmark is the symbol of quality in steel wherever men drill for and produce oil today.

Greatest Achievement in

BLOWOUT PREVENTION
CAST BY TESCO

Cameron Iron Works pioneered the development of drilling control equipment 25 years ago and has continuously improved design and construction to keep pace with increasing depths and pressures. The remarkable "QRC" Blowout Preventer . . . cast, liquid quenched and drawn by TESCO to obtain the physical properties shown below . . . is the answer to their quarter-of-a-century of unceasing efforts. We at TESCO are justifiably proud of the part we have had in this achievement.

PHYSICAL PROPERTIES:

Y. P.	74,000 p.s.i.
Ult.	102,000 p.s.i.
Elong.	23.0%
R. A.	50.0%
B. H. N.	212

TEXAS ELECTRIC STEEL CASTING CO.

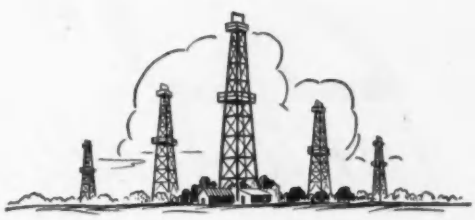
GOOD CASTINGS — CARBON AND ALLOY STEEL TESCO — HOUSTON, TEXAS

T E S C O

BETTER STEEL FOR MODERN INDUSTRY

A REGULATOR THAT *Regulates*

The NIXON SELECTIVE FLOW DIFFERENTIAL REGULATOR "High Pressure"



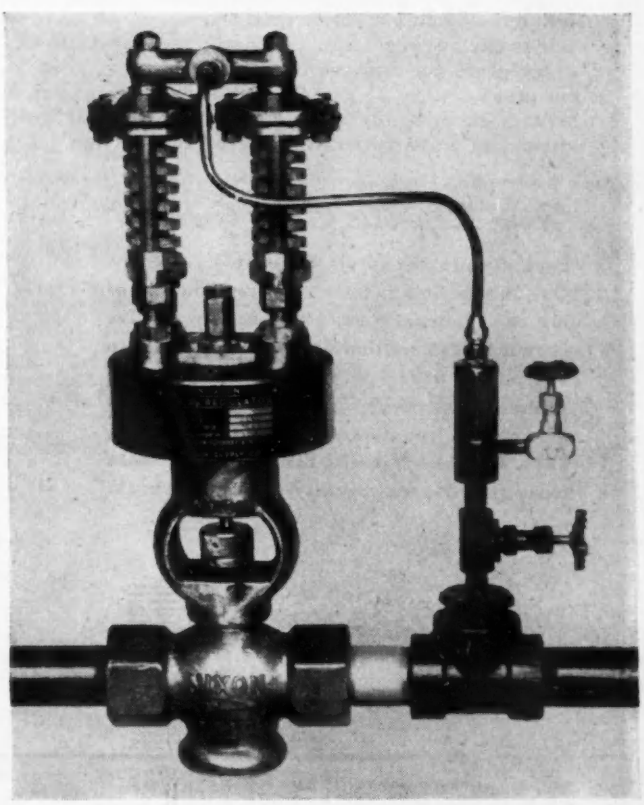
There are many applications for the Nixon "selective flow differential" REGULATOR

(a) **on high pressure lines in regular pressure reduction work.**

(b) **on high pressure separators as back pressure valves.**

(c) **on flow lines from gas wells which make fluid.**

(d) **as a safety valve on flow lines from high pressure oil wells.**



The NIXON REGULATOR is "tomorrow's" Regulator . . . available to the industry NOW. It has proven its superior performance qualities under varied and most severe conditions. If you want a Regulator that really "Regulates" get a NIXON REGULATOR.

WILSON SUPPLY COMPANY

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SALES OFFICES: Tulsa, Oklahoma: Dallas and Beaumont, Texas. LOS ANGELES: Western Pressure Control, 5700 Santa Fe Ave. TRINIDAD, B.W.I.: Neal Massey Eng. Corp.

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REPUBLIC NATIONAL BANK

Observes its

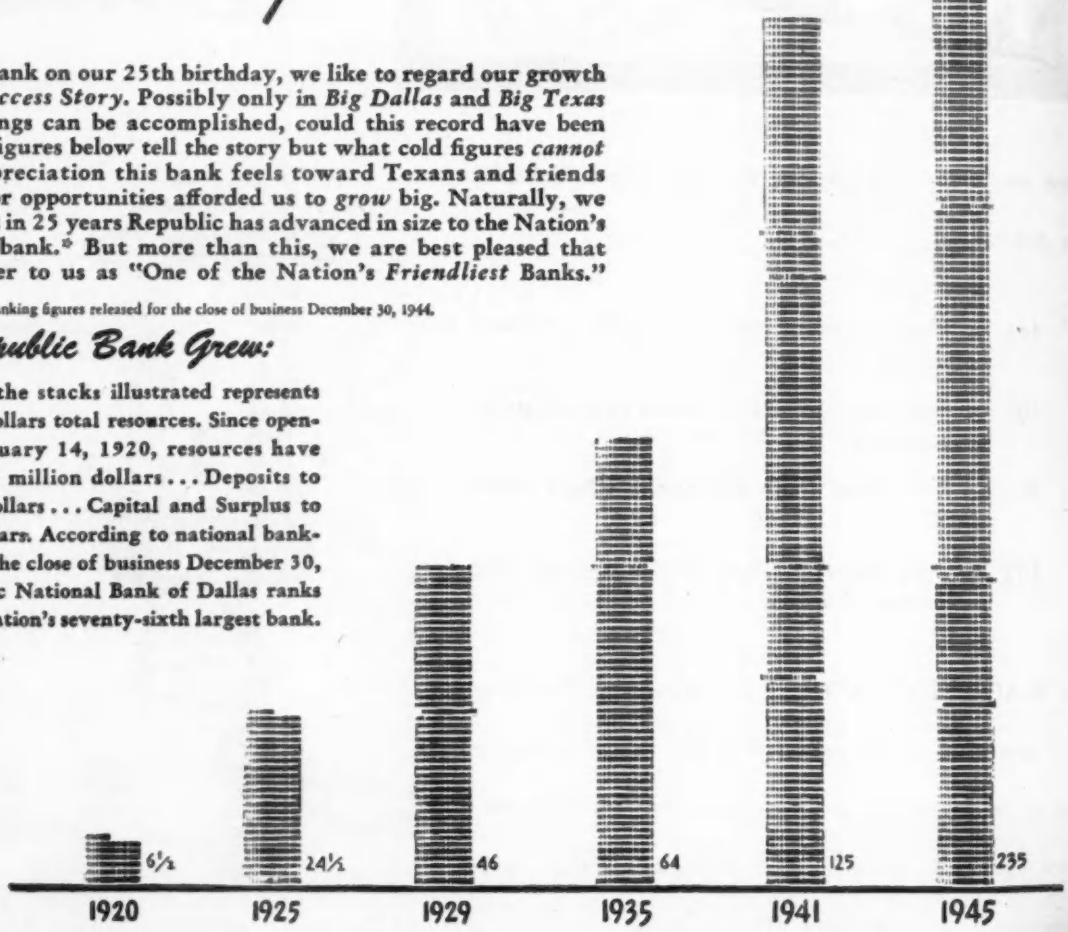
25th *Anniversary*

At Republic Bank on our 25th birthday, we like to regard our growth as a *Texas Success Story*. Possibly only in *Big Dallas* and *Big Texas* where big things can be accomplished, could this record have been written. The figures below tell the story but what cold figures *cannot* tell is the appreciation this bank feels toward Texans and friends everywhere for opportunities afforded us to *grow* big. Naturally, we are proud that in 25 years Republic has advanced in size to the Nation's seventy-sixth bank.* But more than this, we are best pleased that customers refer to us as "One of the Nation's *Friendliest* Banks."

*Based on national banking figures released for the close of business December 30, 1944.

How Republic Bank Grew:

Each coin in the stacks illustrated represents One Million Dollars total resources. Since opening day, February 14, 1920, resources have grown to 235 million dollars . . . Deposits to 221 million dollars . . . Capital and Surplus to 15 million dollars. According to national banking figures at the close of business December 30, 1944, Republic National Bank of Dallas ranks today as the Nation's seventy-sixth largest bank.



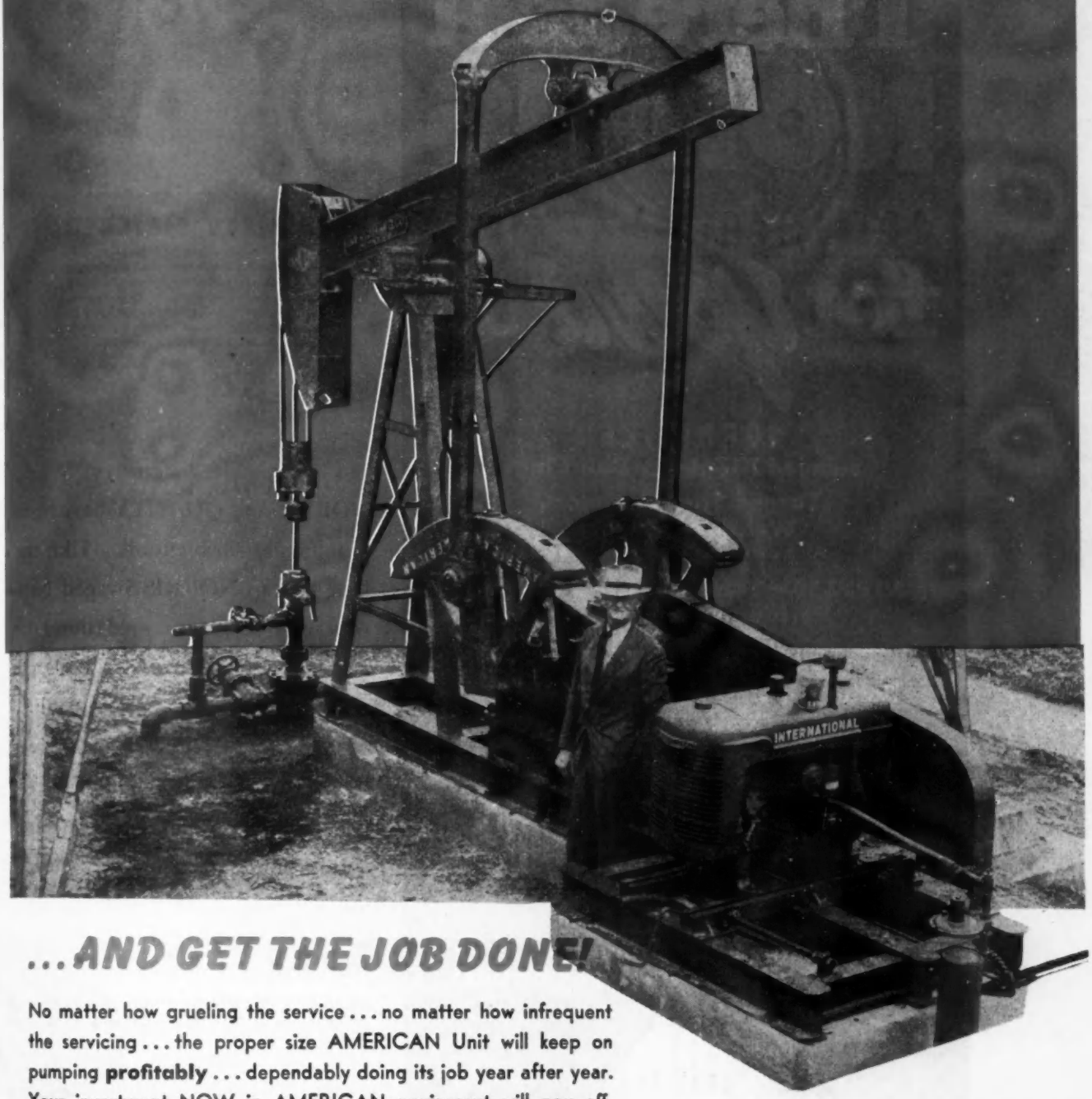
REPUBLIC NATIONAL BANK

OF DALLAS

MEMBER FEDERAL DEPOSIT INSURANCE CORP

ONE OF THE NATION'S 100 LARGEST BANKS

PUT AN AMERICAN ON THE JOB



...AND GET THE JOB DONE!

No matter how grueling the service . . . no matter how infrequent the servicing . . . the proper size AMERICAN Unit will keep on pumping **profitably** . . . dependably doing its job year after year. Your investment NOW in AMERICAN equipment will pay off, in years of satisfactory, trouble-free service. American equipment is available for immediate delivery. Write or phone us **today.**

American Manufacturing Co. of Texas

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Unit Pumpers • *Pumping Jacks* • *Swings* • *Crown Blocks* • *Bull Plugs*
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EXPERIENCE BUILDING OIL TOOLS SINCE 1882

There is a NORRIS Tubular Product for *your* job

NORRISIZED
Swaged Nipples & Bull Plugs

Forged Steel Seamless Welding Reducers
Also available in wrought iron.

NIPPLES — Tubing, Casing, Adaptor
Perforated Pipe Nipples

NORRISIZED
Boiler Nipples, Open Flow Nipples, Choke Nipples

Segmentally Welded Pipe Fittings
steel or wrought iron
Grooved — Beveled — Plain End

NORRISIZED
Seamless Steel Substitute Collars
for reducing tubing or pipe

Forged Steel Seamless Casing, Tubing and Line Pipe Couplings

QUALITY MAKES FRIENDS

NORRISIZED FINISHED

W. C. NORRIS pioneered and introduced the exclusive NORRISIZING treatment that eliminates rust and corrosion. Prevents galling and seizing of threads, giving you products that remain bright and new throughout their useful life. To be sure of NORRISIZED Finish, insist on only the genuine W. C. NORRIS — look for the label.

For over half a century, W. C. NORRIS and QUALITY have been synonymous in oil tools. Like the long famous NORRIS Swaged Nipples and Bull Plugs—used round the world, NORRIS Tubular Products through quality and dependability on the job have won for themselves the highest endorsement of Petroleum Engineers, Superintendents and Production Men of long experience.

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FOR VICTORY

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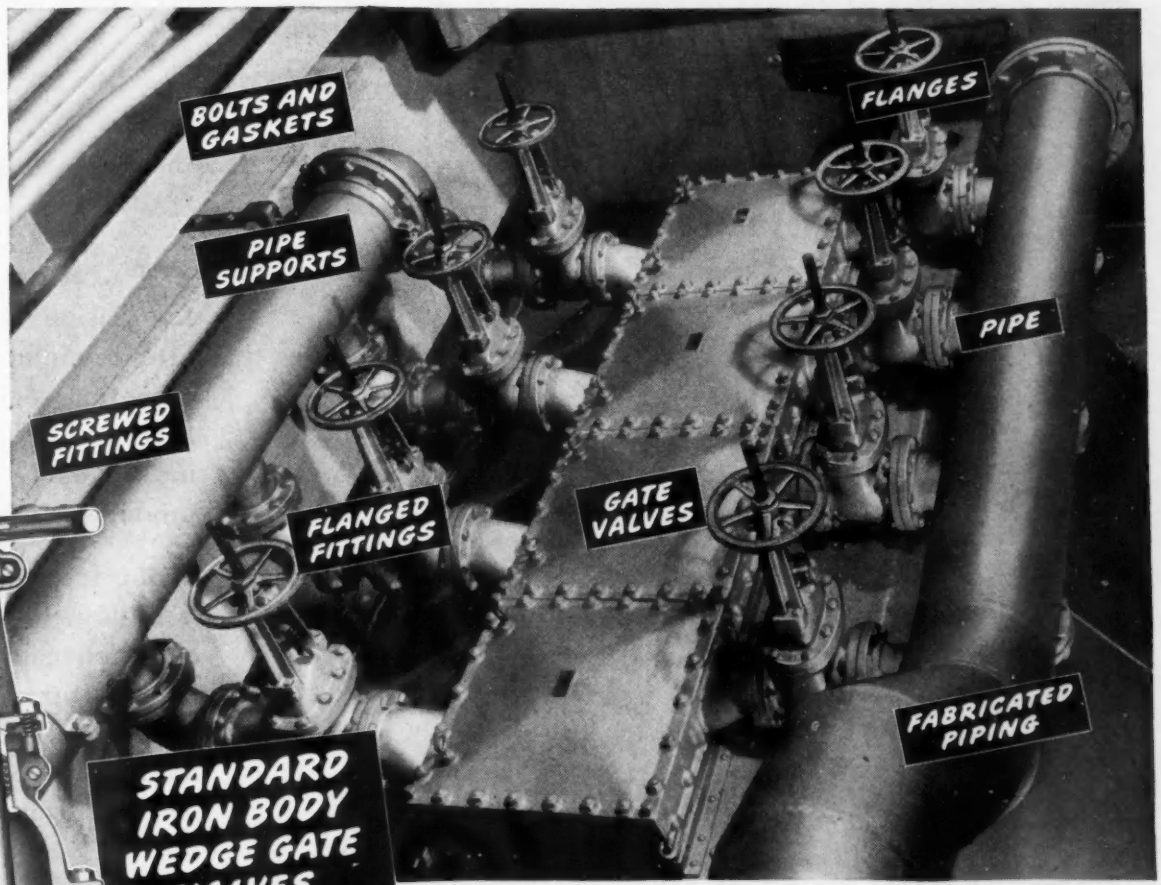
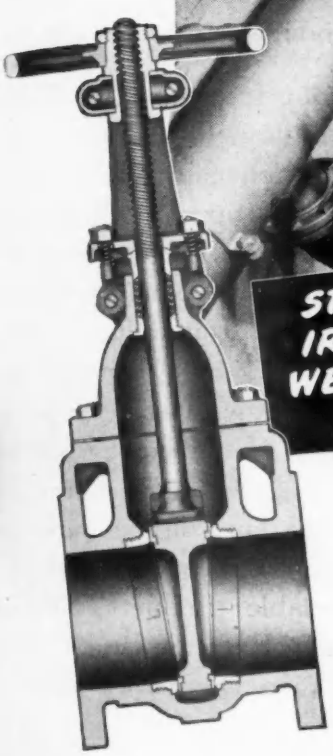
ONE STANDARD OF QUALITY

No matter what your need in piping materials ... your Crane Branch or Wholesaler can meet it. One order covers all requirements at any time. You choose from the world's greatest line of piping materials—in brass, iron and steel. You help assure the best piping installation because all parts are of uniformly high quality—backed by a single responsibility. Not only do you simplify and speed deferred replacement work by using Crane *complete* piping materials service—but you get full benefit of Crane Co.'s 90-year experience in the piping equipment field.



Water inlet and outlet to generator air coolers in power plant.



STANDARD IRON BODY WEDGE GATE VALVES

SERVICE RECOMMENDATIONS: **Crane Standard Iron Body Wedge Gate Valves** with brass trim are recommended for steam, water or oil lines; all-iron valves for oil, gas or fluids that corrode brass but not iron. Made in O.S. & Y. and Non-Rising Stem patterns.

Working Pressures

Size of Valve	Screwed or Flanged Valves		Hub End Valves
	Saturated Steam	Cold Water, Oil, or Gas, Non-Shock	Cold Water or Gas Non-Shock
2 to 12 in.	125 pounds	200 pounds	200 pounds
14 and 16 in.	125 pounds	150 pounds	150 pounds
18 to 24 in.	*	150 pounds	150 pounds

*For steam lines larger than 16-inch, Crane 150-pound Cast Steel Gate Valves are recommended.

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Ill. • *Branches and Wholesalers Serving All Industrial Areas*

CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

These are the Field Advantages of
SPANG EXTREME LINE CASING

SPANG Extreme Line Casing assures the absolute minimum of time for operation requirements . . . keeps things moving . . . makes each minute more productive.

Spang Extreme Line Casing is built with over 100 years experience in quality pipe manufacture . . . built with knowledge gained from intimate development with the American oil industry since the days of Colonel Drake . . . built with a sincere recognition of the great responsibility now being borne by the nation's oil men, and the important part which dependable products such as Spang Extreme Line Casing play in their daily work.

SPANG-CHALFANT
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General Sales Office:
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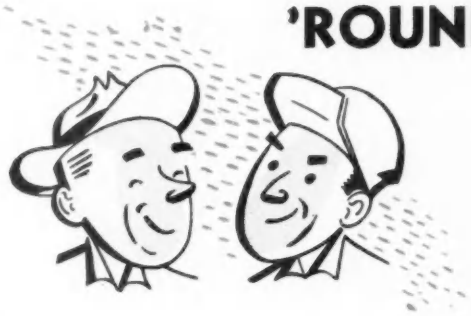
SPANG-

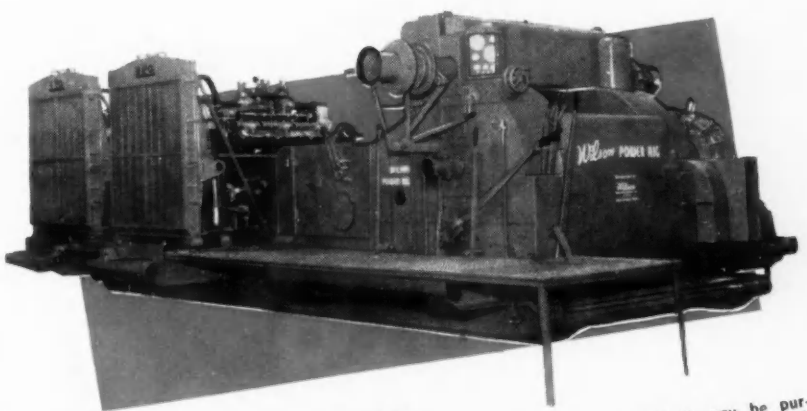
WORD DOES GET 'ROUND, YOU KNOW!



You fellows in the drilling industry know how you pass news around. When you get hold of a rig that really "goes to town" you don't waste time telling about it. Likewise, if it's not satisfactory, you don't hesitate to express your feelings, either.

Thanks to you—the man who knows his stuff when it comes to drilling—we have been enabled to visualize what drillers want most from a rig and to *Set the Pace* in rig design and performance.

Incidentally, if you haven't heard about Wilson's New Super Titan Rig, capable of drilling 15,000 ft. and more, you're due for a choice piece of news. Why not let us give you the dope on it, right away?



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PACIFIC COAST DISTRIBUTOR - H & B SALES CO., LTD. - LONG BEACH, CALIFORNIA

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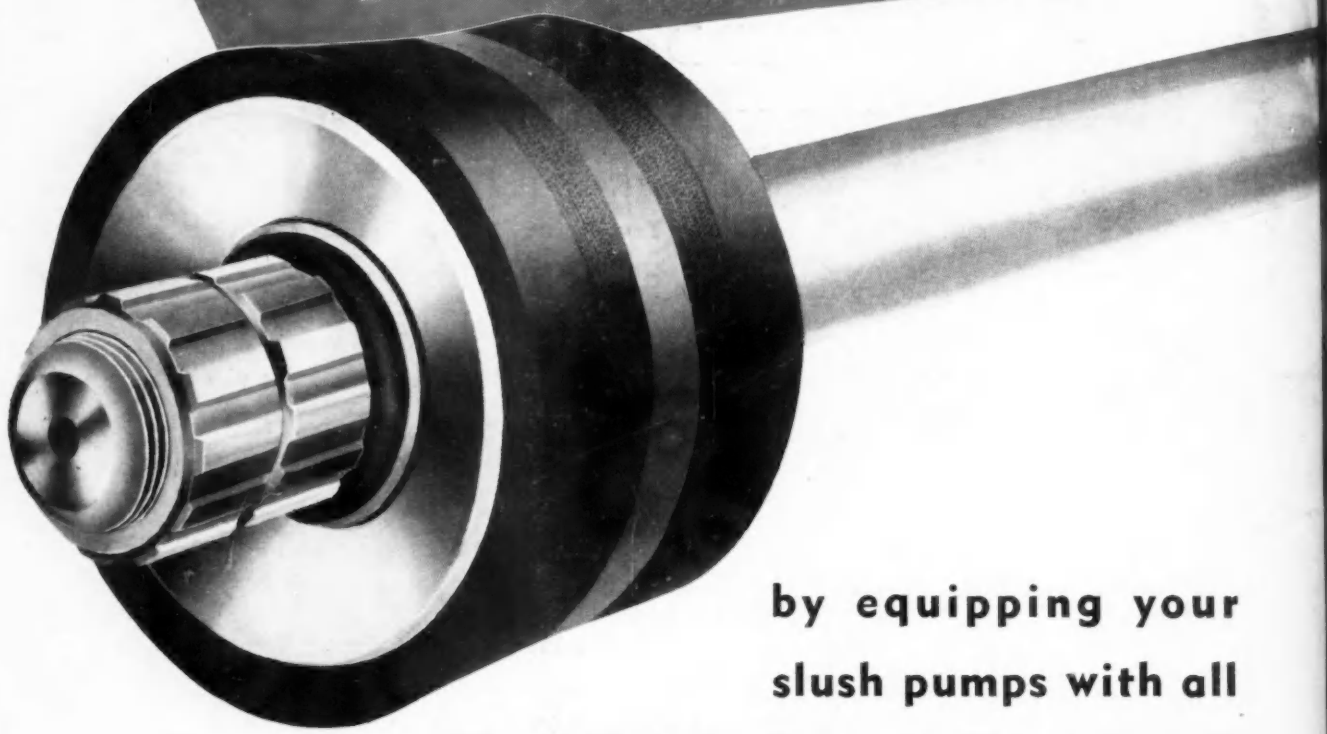
WILSON RIGS AND WINCHES may be purchased from the following: JONES & LAUGHLIN SUPPLY CO., BOVAIRD SUPPLY CO., The INDUSTRIAL SUPPLY CO., MID-CONTINENT SUPPLY CO., and other recognized supply companies.

Wilson MANUFACTURING CO., INC.

WICHITA FALLS, TEXAS

SPEED UP YOUR DRILLING...



by equipping your slush pumps with all

MISSION SLUSH PUMP PARTS

MISSION *Fluid End* PISTONS
GIVE YOU EXTRA LONG SERVICE **because** of the extremely long, trouble-free piston rubber life. These rubbers are usually giving good service long after ordinary pistons have worn out due to: 1, the combination of tough rubber compound and advanced design; 2, the large wiping surface and positive seal, assuring longer life for rubbers. Other advantages accruing from this principle are longer liner life, more fluid per stroke, and more hole per hour.

Replaceable Rubbers Reduce Piston Renewal Cost—When after a long, uninterrupted run, the rubbers are finally worn out, the piston is renewed at much less than its original cost by simply installing new piston rubbers on the old body. These rubbers are easily replaced at the rig without removing the piston from the rod.

MISSION PISTON RODS
. . . have been the choice of leading operators all over the world for years. The excellent wearing qualities of the file-hard surface is due to Mission's special combination of heat treatment and rod material. These rods combine a core tensile strength of over 120,000 pounds per sq. in. with exceptionally high ductility. This combination of strength and toughness gives maximum protection against rod breakage.

USE ALL MISSION PUMP PARTS
VALVES, PISTONS, RODS AND GLAND PACKINGS

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Mission
MANUFACTURING CO.
HUMBLE ROAD HOUSTON, TEXAS

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